

Attentional Bias to Threat and Attributional Style in the Eating Disorders

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Overview

The following thesis is presented in three parts. The first part is a review paper, which critically examines the literature on threat processing in the eating disorders. The processing biases that have been studied in the eating disorders are described within a framework that accounts for the possible stages of threat processing in this group. The second part of this thesis is an empirical study, examining attentional bias to threat and attributional style in the eating disorders. This study aimed to determine levels of attentional bias to threat and attributional style in the eating disorders, and the impact of depressed mood and severity of eating pathology. It also aimed to determine the relationship between attentional bias to threat and attributional style. This study found that women with an eating disorder had a greater tendency to attribute negative events to the self, compared to non-clinical women, and despite the impact of depressed mood. There were no differences between the groups in levels of attentional bias to threat. The third part of this thesis is a critical appraisal of the empirical study reported in part two. This appraisal provides a personal reflection on the study and predominantly focuses on the most clinically relevant findings, and the strengths and weaknesses of the research.

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Part 1: Review Paper

Stages of Threat Processing in the Eating Disorders

Stages of Threat Processing in the Eating Disorders

Abstract

Research in the eating disorders has begun to identify biases in the processing of threat-related information. The schema model of eating disorders suggests that these processing biases are driven by core belief content. The current paper reviews existing literature on the processing of threat-related information in the eating disorders. In particular, studies examining subliminal processing, biases in attention and memory, cognitive avoidance and attributional biases are reviewed. These studies are described within a framework that accounts for the possible stages of threat processing in the eating disorders. The clinical implications of threat processing in the eating disorders are considered, and suggestions are made for future research in this area.

Stages of Threat Processing in the Eating Disorders

1 Introduction

Cognitive conceptualisations of the eating disorders have expanded over recent years. The focus has begun to shift from cognitions surrounding food, body shape and weight (e.g., Fairburn, Cooper & Cooper, 1986) to schema-level cognitions (e.g., Waller, 2005; Waller, Kennerley & Ohanian, 2004). Schema-based conceptualisations consider both the role of core belief content and the cognitive processes that are driven by and maintain those beliefs. The current paper starts by briefly describing current cognitive conceptualisations of the eating disorders, and then reviews the studies that have examined the processing of threat in this client group. These studies are described within the framework proposed by Beck and Clark (1997) of the different stages of threat processing. The first stage involves preconscious processing of subliminally presented information, the second stage includes attentional biases and memory biases, and the third stage covers cognitive avoidance and attributional biases. Since many of the studies carried out with the eating disorders were based on findings from other psychological disorders (e.g., anxiety and depression), a brief summary of the relevant findings for these disorders is given.

1.1 Existing cognitive models of the eating disorders

Early cognitive conceptualisations of the eating disorders focus on the role of negative automatic thoughts, dysfunctional assumptions and distorted beliefs about weight, body shape and food (e.g., Fairburn et al., 1986). In this

form of model, the central cognitive characteristic in the eating disorders is an extreme concern about weight and shape. The individual uses their ability to control their body shape and weight to enhance their self-worth. Extreme weight control behaviours (such as dietary restraint, self-induced vomiting, laxative and diuretic misuse, and over-exercising), excessive body checking and avoidance, and a preoccupation with thinking about food are seen as consequences of these central concerns. For example, binge eating is described as a product of the inevitable breaking of strict dietary rules, where minor lapses result in dietary restriction being temporarily abandoned. These lapses are usually preceded by a negative mood state, which is then temporarily reduced by the binge (Fairburn et al., 1986; Vitousek, 1996). However, concerns about shape and weight are ultimately increased, resulting in the use of weight control behaviours to compensate. Thus, a vicious cycle is established.

More recent accounts of this cognitive model suggest that a pervasive negative view of the self is an important element in the eating disorders (Fairburn, 1997; Fairburn, Cooper & Shafran, 2003). As these individuals feel inadequate in many areas of their life, they evaluate themselves solely in terms of their weight and shape, because this domain is perceived as more controllable. However, their ongoing self-criticism renders them continually dissatisfied, so they strive even harder for control and thinness. Perfectionism and dichotomous thinking are also described as having maintaining roles as unobtainable high standards and rigid rules are adopted and inevitably broken, resulting in the extreme eating behaviour of either dieting excessively or bingeing.

The models described so far predominantly account for the behaviours common in bulimia nervosa. In anorexia nervosa, where restriction of food intake is more prominent than bingeing and purging, the psychological and physiological effects of starvation (e.g., preoccupation with thoughts about food, increased negative affect, and an exaggerated sense of fullness) further increase concerns about shape and weight, so that the rigid diet is maintained (Fairburn, 1997; Fairburn et al., 2003). Furthermore, many such patients do not perceive themselves as having a problem, since their restrictive behaviour is seen as desirable (e.g., Serpell, Treasure, Teasdale & Sullivan, 1999). In binge eating disorder, which involves bingeing in the absence of purging, the reduction of negative affect following a binge is more relevant than concerns about shape and weight (Fairburn, 1997).

Based on these cognitive conceptualisations, cognitive-behavioural therapy (CBT) for the eating disorders has focused on addressing the central concerns about shape and weight and general negative self-evaluation (see Fairburn, 1997). There is evidence that CBT based on this model is partially successful with specific groups – particularly uncomplicated bulimia nervosa and binge-eating disorder (Fairburn & Harrison, 2003; National Institute for Clinical Excellence, 2004). However, there is less evidence of effectiveness with anorexia nervosa or atypical eating disorders that do not meet the full diagnostic criteria (Fairburn & Harrison, 2003; Vitousek, 1996; Waller & Kennerley, 2003). Therefore, cognitive models that focus on weight and shape are not sufficient to explain or treat the range of eating psychopathologies (Fairburn et al., 2003; Waller, Dickson & Ohanian, 2002; Waller, Ohanian, Meyer & Osman, 2000), and other developments need to

be considered in understanding the eating disorders.

1.2 Recent developments in the cognitive model of the eating disorders

There have been three broad, interlinked developments in the cognitive model of the eating disorders in recent years. First, Fairburn and colleagues (e.g., Fairburn et al., 2003) have extended the earlier cognitive models by proposing the existence of four additional maintaining factors. First, clinical perfectionism refers to a tendency to strive towards personally demanding standards, resulting in fear of weight gain, self-criticism, and frequent checking of one's weight, shape and caloric intake. Second, core low self-esteem refers to the pervasive negative view of oneself (described above - see Fairburn, 1997). This feature is a common obstacle in treatment, since it precipitates feelings of hopelessness about change and makes the individual more determined to achieve valued goals (i.e., control over weight, shape and eating). Third, mood intolerance describes the negative mood states that disrupt dietary restraint and trigger a binge. Some individuals are unable to cope effectively with experiencing negative affect, and so reduce their awareness through dysfunctional eating behaviours (such as bingeing and vomiting) or through impulsive behaviours (e.g., self-injury, substance misuse). Finally, interpersonal difficulties can maintain an eating disorder by undermining self-esteem, precipitating an episode of binge eating, increasing a need for control, or promoting a culture that values thinness. Not all of these components are necessarily present in each individual.

The authors argue that different eating-disordered groups (e.g., bulimia nervosa, anorexia nervosa, atypical eating disorders/eating disorders

not otherwise specified) share common underlying maintaining mechanisms, and that individuals often move between different diagnoses throughout the course of their illness. In addition, atypical eating disorders are probably the most common presentation in clinical settings (Fairburn & Harrison, 2003), even though research usually excludes this group. Therefore the extended model described above, and the treatment package based on it, are described as being 'transdiagnostic' (Fairburn et al., 2003). A research trial using this treatment package is currently being carried out, and preliminary results suggest that the outcomes of this therapy represent an improvement over previous evidence of clinical effectiveness (Fairburn, 2004).

The second recent development has been the adaptation of dialectical behavioural therapy (DBT; Linehan, 1993) for bulimia nervosa and binge eating disorder (for a review, see Kotler, Boudreau & Devlin, 2003). This treatment is based on the theory that eating-disordered behaviours function to reduce negative mood states ('mood intolerance', in the model of Fairburn et al., 2003). DBT aims to promote adaptive affect regulation by helping the patient to examine the problematic behaviour thoroughly and to learn skills in mindfulness, emotion regulation and distress tolerance. Research has found DBT effective in reducing episodes of binge eating and concerns about body shape, weight and eating, in addition to yielding low dropout rates (e.g., Telch, Agras, Linehan, 2001). However a high number of patients relapse by six months, particularly those with high levels of dietary restraint (e.g., Safer, Lively, Telch & Agras, 2002). Furthermore, DBT has not been designed to treat anorexia nervosa, and is unlikely to be of help in treating this clinical group.

The third development in conceptualising and treating the eating disorders has drawn on the schema model, originally described by Young (1994). This model focuses on an individual's early experiences, long-standing beliefs, and the processes that maintain those beliefs. Thus, it has overlaps with the constructs of core low self-esteem and perfectionism. The schema model assumes that both general psychopathology and specific eating pathology play roles in the development and maintenance of an eating disorder (e.g., Cooper, Wells & Todd, 2004; Waller, 2005; Waller, et al., 2004). While the existing models of eating pathology detail the disorder-specific cognitions, they are less detailed in their descriptions of the cognitive processes involved and how they maintain the cognitions and generate behaviours.

2 Schema Model

In the study of emotional disorders, information-processing models are particularly focused on the processing of stimuli that are considered by the individual to be emotionally or physically threatening, and on how this contributes to the maintenance of a problem (MacLeod, Mathews & Tata, 1986). There is substantial evidence that individuals process information in a way that is consistent with their schema-level cognitions (see below).

2.1 Schema-based models of psychopathology

The term 'schema' has been used in a number of different ways within the information processing literature. However, it can be broadly defined as a mental structure of meaning, derived from past experience, which assists

with the processing of new information (Williams, Watts, MacLeod & Mathews, 1997; Young, Klosko & Weishaar, 2003). Schemas are mostly formed in childhood and elaborated on throughout life. They represent the human need for consistency, and are therefore hard to change.

Early maladaptive schemas (Young, 1994) are initially adaptive and accurate representations of childhood experiences, but they become less reality-based and more self-defeating over time, usually as the environment changes (e.g., moving out of home). They consist of unconditional core beliefs (about the self, others and the future) and schema processes that maintain the content of these beliefs. Schemas are triggered by situations similar to those encountered in childhood and take on cognitive, behavioural, affective and somatic manifestations. Due to the overwhelming emotions that arise when a schema is activated, a variety of schema processes occur that enable the individual to cope (Young et al., 2003). These include surrendering to the schema (by seeking information and behaving in ways that confirm it), avoiding the schema (by reducing awareness of intolerable cognitions and emotions), and overcompensating (by activating alternative core beliefs, and behaving as though the opposite of the schema were true). However, by preventing disconfirmation of core beliefs, these coping styles inadvertently maintain the schematic content.

Schema therapy aims to help patients identify the content and origins of their schemas, and then uses cognitive, behavioural and affective strategies to heal the schema and replace maladaptive coping styles with more adaptive ones (Young et al., 2003). It was initially developed to treat patients with entrenched psychological problems who had not benefited from

traditional CBT. However, at present, there is a lack of evidence base for schema-focused therapy (Ainsworth, Waller & Kennedy, 2002).

2.2 Schema-based models of eating disorders

Within the eating disorders, a number of core beliefs have been identified that are unrelated to concerns about food, shape and weight. These include perceptions of the self as being flawed, dependent, unsuccessful, lacking in control, deprived of emotional support and socially different to others, and the belief that expressing emotions will result in adverse consequences (e.g., Waller et al., 2000; 2002). It is suggested that these core beliefs contribute to the pathological behaviours associated with an eating disorder.

Research in the eating disorders has also begun to identify biases in the processing of information. These biases are hypothesised to be driven by and support the core belief content, and are seen as manifestations of the schema processes identified by Young et al. (2003) (see above). They subsequently maintain pathological eating behaviours (e.g., Waller, 2005).

The schema model of eating disorders (i.e., Waller, 2005; Waller et al, 2004) fits closely with Beck and Clark's (1997) information-processing model of anxiety disorders, in that they both highlight the important role of information-processing errors in the maintenance of a disorder (Ainsworth et al., 2002). Therefore, the current paper will use the structure of Beck and Clark's model as a guide to reviewing the literature on the possible stages of threat processing in the eating disorders. This will begin with a brief description of the model.

2. Stages of Threat Processing

Beck and Clark's (1997) three-stage information-processing model seeks to explain the cognitive processing bias towards mood-congruent and threat information that has been found in anxiety. They suggest that the cognitive, affective, physiological and behavioural components of anxiety arise from this information-processing sequence.

The first stage involves the initial automatic registration of the stimulus. Processing at this stage is rapid, involuntary and outside conscious awareness. Minimal attentional resources are allocated to any one stimulus, and it is hypothesised that the aim of this stage is to identify and assign information-processing priority to stimuli perceived as threatening. At this stage, perception of threatening stimuli is simply based on their valence (i.e., negative, positive or neutral) or personal relevance. Studies examining preconscious processing have tended to present stimuli subliminally (for less than twenty milliseconds).

The second stage involves the activation of the primal threat mode, defined as a cluster of interrelated primitive schemas that are used to appraise the stimuli as threatening. Primal modes are rigid and take up most attentional resources when activated. As a result, there is limited capacity for secondary (and potentially more accurate) appraisal of the potentially threatening stimuli. Processing at this stage is also described as rapid and somewhat involuntary, although the individual will be aware of the cognitive, affective, behavioural and physiological consequences of the threat appraisal. Threatening information is also more likely to be encoded into memory than other available information. Previous research on this aspect of

processing has mostly presented stimuli for less than two seconds.

The third stage involves the secondary activation of elaborate and reflective modes. Information processing at this stage is intentional rather than automatic, and therefore occurs at a more conscious level. It is characterised by a slower, more strategic and reflective style of processing. Personal schemas and contextual information are used to evaluate the stimuli and available coping resources.

3.1 Initial registration of a threat stimulus

Studies examining information processing at this preconscious stage have employed subliminal methods (below the threshold of awareness). This began in the 1960's, when Silverman (cited in Balay & Shevrin, 1988; Weinberger & Hardaway, 1990) examined preconscious processing in patients with schizophrenia. Silverman's aim was to test psychoanalytic hypotheses using the subliminal psychodynamic activation (SPA) method, which involved rapidly flashing neutral and experimental stimuli (words or pictures) on a screen, and observing subsequent behavioural changes. The content of experimental stimuli was designed to stimulate unconscious anxieties and fantasies. Silverman claimed to have observed changes in the verbal and non-verbal behaviour of patients following the subliminal presentation of aggressive and libidinal stimuli, and interpreted this as evidence for the presence of unconscious processes, since the subliminal presentation of stimuli was hypothesised to bypass defence mechanisms. However, his studies have come under much criticism, mainly regarding the reliability of the methodology and the validity of stimuli used.

More recent studies into subliminal processing have used the modified Stroop colour-naming task (Stroop, 1935). Commonly referred to as the emotional Stroop, this task involves naming the colour of the ink used to display a list of mood-relevant and neutral or non-words (matched on word frequency, length and first letter), presented on a screen. Each word is presented very rapidly (below the individual's level of awareness), followed by a mask consisting of a string of randomly selected letters. An interference effect is inferred when the mood-relevant cues lead the individual to be slower to colour-name a list of mood-relevant words compared to a list of matched neutral words. It is hypothesised that this reflects the subliminal activation of relevant schemas, which guide attention towards the actual word rather than the colour (e.g., Wells & Matthews, 1994).

3.1.1 Preconscious processing in anxiety and depression

Using this subliminal technique, it has been found that clinical groups and non-clinical individuals with high levels of anxiety are slower at colour-naming anxiety-related and more general negative words compared to non-anxious groups (e.g., MacLeod & Hagan, 1992; Mogg, Bradley, Williams & Mathews, 1993; Van den Hout, Tenney, Huygens, Merckelbach & Kindt, 1995). These findings are consistent with Beck and Clark's (1997) model, in that information processing priority is given to threatening stimuli and this occurs outside conscious awareness. Given that anxious participants have been found to show this bias for general negative information rather than just anxiety-related stimuli, these findings support the claim that the initial registration stage of processing is influenced by the valence of information.

In contrast, with regards to depressed participants, Mogg et al. (1993) did not find an interference effect towards depression-related or general negative words, even though these individuals had similar levels of anxiety to the anxious group. The researchers suggest that the amotivational state of depression might inhibit the anxiety-related bias. Furthermore, in depression, it has been suggested that priority towards negative information occurs at a later stage of processing (Williams et al., 1997).

3.1.2 Preconscious processing in the eating disorders

In the eating disorders, research on subliminal processing can be separated into findings for food- and shape-related stimuli (disorder-specific information) and findings for emotional stimuli not directly reflecting eating pathology (general threat information).

3.1.2.1 Disorder-specific information

Studies using the modified Stroop task with words relating to food, shape and weight have not found evidence of interference effects in patients with anorexia nervosa (Sackville, Schotte, Touyz, Griffiths & Beumont, 1998) or non-clinical, highly restrained eaters (Jansen, Huygens & Tenney, 1998). However, another study carried out with women with bulimic psychopathology using auditory stimuli (via a dichotic listening task) did find evidence of a processing bias towards food- and shape-related cues (Schotte, McNally & Turner, 1990).

Meijboom, Jansen, Kampman and Schouten (1999) primed low self-esteem and used a lexical decision task, asking participants to decide

whether a word or non-word had been subliminally presented. Highly restrained eaters with primed low self-esteem classified more eating-related words correctly than neutral words, compared to low restrained eaters and non-primed participants. This suggests that in restrained eaters, activating the low self-esteem schema increased the priority given to preconscious processing of eating-related stimuli.

Another study found that women with unhealthy eating attitudes reported poorer body concept (level of satisfaction with one's body) and body percept (internal visual image of one's body shape) following subliminal presentations of 'fatness' cues, but were not affected by 'thinness' cues (Waller & Barnes, 2002). In contrast, women with healthier eating attitudes showed an improvement in their body percept following presentations of 'thinness' cues. It was hypothesised that negative and positive body image schemata were activated by the relevant stimuli, and the nature of these schemas are reflected in the individual's eating attitudes (Waller & Barnes, 2002).

3.1.2.2 General threat information

With regards to emotional stimuli unrelated to eating pathology, Patton (1992) found that non-clinical women with unhealthy eating attitudes ate more when carrying out a taste discrimination task if they had been exposed to a subliminal presentation of an abandonment message (compared to a neutral message). It was concluded that eating functioned to alleviate concerns about abandonment, although it could have reflected difficulties in decision-making (Meyer & Waller, 1999).

Waller and Mijatovich (1998) extended this research, using subliminal messages that included a more general self-esteem (ego) threat, a physical threat and a neutral cue. They left the non-clinical participants to eat of their own accord, rather than involving them in a decision-making task. Women with unhealthy eating attitudes ate more after exposure to both threats, but especially the ego threat. The researchers hypothesised that the preconscious activation of threat-related schemata resulted in the escape behaviour of eating. However, as both these studies were carried out with non-clinical samples, it is not clear whether the eating that occurred mirrored bingeing behaviour (Waller & Mijatovich, 1998).

Extending this research further, Meyer and Waller (1999) compared the preconscious processing of eating-related and emotional stimuli, and found that non-clinical women (who had not eaten for four hours) ate more after being exposed to a subliminal abandonment cue than a neutral, emotionally positive or food-related cue. Participants with unhealthy eating attitudes also ate more following a hostile emotional cue compared to a neutral cue. This suggests that, at this preconscious stage of processing, emotionally negative stimuli rather than emotional information in general (i.e. positive or negative) influences eating behaviour. It also provides evidence for the influential role of more general negative schemas, rather than specific food- and shape-related schemas in overeating (Meyer & Waller, 1999).

3.1.3 Summary

The studies examining disorder-specific information provide inconsistent evidence of a preconscious processing bias towards food- and

shape-related stimuli in women with high levels of eating pathology. The studies using the emotional Stroop did not identify such a bias whereas the study using the dichotic listening task did. Furthermore, findings from the other two studies suggest a link between the activation of self-esteem or body image schemata and a processing bias. It should be noted that the Stroop studies were limited to non-clinical restrained eaters and a specific group of individuals with anorexia, which does not reflect the wide range of eating pathology found in the eating disorders. It has been suggested that restrictive and bulimic pathologies (across diagnoses) may be associated with different cognitive processes (Waller, 2005).

There is consensus among studies examining general threat that this type of information had an impact on eating behaviour. It has been hypothesised that this finding reflects the activation of general threat-related schemata, although this claim needs further investigation. In addition, as these studies have been carried out with non-clinical groups, generalisations to an eating disordered population should be made with caution. In general, the findings indicate that preconscious information processing priority is allocated to threatening stimuli, which is consistent with Beck and Clark's (1997) model.

3.2 Activation of the primal threat mode

At this stage of processing, supraliminal methods have been used to study attentional biases (i.e., focusing on certain types of information) and memory biases (i.e., recognising or recalling certain types of information) in anxiety, depression and the eating disorders. These may also reflect a type

of 'schema surrender' coping style (Young et al., 2003). Studies of memory biases have used real-life or experimental material, intentional or incidental learning and mood induction techniques. In contrast, studies of attentional biases have used the modified Stroop task and the dot probe task (MacLeod et al., 1986). These methodologies will be described in more detail here.

At this level of processing, the Stroop task involves colour-naming a list of mood-relevant and neutral words, which are presented for a few seconds (on a screen or cards) and which are therefore within the participant's level of awareness. As with subliminal tasks, it is assumed that, once activated, schemas guide attention to congruent stimuli (Wells & Matthews, 1994), which is reflected in a slowing of colour-naming disorder-relevant words. However the Stroop task has received a number of methodological criticisms, which will be discussed in more detail later. The dot-probe task was therefore developed in response to these potential shortcomings.

The dot-probe task involves the simultaneous presentation of two words in different areas of a screen. The words then disappear, and a dot is presented in the spatial location of either word. Participants are required to press a button when the dot is detected. An attentional bias is assumed if there is a quicker response when the dot replaces a mood-relevant word, as attention is focused on this location. Thus, on the Stroop task, an attentional bias hinders performance; on the dot-probe task, it facilitates performance.

3.2.1 Attentional bias in anxiety and depression

Using the emotional Stroop, it has been well established that anxious

individuals are slower to name the colour of anxiety-related words, supporting the hypothesis of an attentional bias (see Williams et al., 1997; Williams, Mathews & MacLeod, 1996). There have been mixed findings for an attentional bias towards more general negative words and positive emotional words. Similarly, studies using the dot-probe task with anxious individuals have found they respond quicker to the cue if it replaces a threat word compared to a neutral word, whilst non-anxious participants show the opposite pattern (for reviews see Wells & Matthews, 1994; Williams et al., 1997). Williams et al. (1997) concluded that this does not imply that anxious individuals are more sensitive in picking up threat, but indicates that they allocate more attention to it compared to non-anxious individuals (who orient away from threat). While most of the studies into anxiety and attentional bias have involved the processing of visual stimuli, Williams et al. (1997) have shown that anxious clinical and non-clinical participants also show an attentional bias toward auditory threat-related stimuli on dichotic listening tasks.

These findings support Beck and Clark's (1997) model, indicating that this second stage of processing focuses more on specific threat than on the simple valence of the stimuli. They suggest that these individuals have an overactive danger schema (MacLeod et al., 1986). However, studies that have found an attentional bias towards more general negative words and positive words indicate that all emotional stimuli are given information-processing priority.

Mogg et al. (1993) suggest the mixed findings for general negative and positive stimuli are due to differences in the Stroop materials used. The

card Stroop tasks, which have generally found an attentional bias towards positive information, allow more time for elaborate processing to occur so adaptive mood regulatory processes (such as attending to positive information) can be used to counteract negative mood states. Alternatively from a theoretical point of view, the positive emotional words may still be semantically related to the threat schemata (Williams et al., 1996).

Studies of depression using the emotional Stroop task have generally found that clinical and non-clinical depressed participants are slower at colour-naming negative words than neutral or positive words (for reviews, see Williams et al., 1997; Williams et al., 1996). This provides further support for the claim that, in depression, a bias towards negative information occurs at this later stage of processing (Williams et al., 1997). However, using the dot-probe task, MacLeod et al. (1986) did not find an attentional bias towards mood-congruent words in depressed individuals.

3.2.2 Attentional bias in the eating disorders

As with the literature on subliminal processing, research on supraliminal processing in the eating disorders can be separated into findings for food- and shape-related stimuli (disorder-specific information) and findings for emotional stimuli (general threat information). However in contrast to the subliminal literature, supraliminal studies have been carried out extensively with both clinical and non-clinical groups. The majority of studies have used the emotional Stroop, although two have used the dot probe task.

3.2.2.1 Disorder-specific information

With regards to food- and shape-related stimuli, many studies employing a non-clinical sample have found a relationship between unhealthy eating attitudes and interference effects for these words on the Stroop task (Davidson & Wright, 2002; Green & Rogers, 1993; Perpina, Hemsley, Treasure & De Silva, 1993). However other studies have not been able to replicate these findings on the Stroop or the dot probe task (Ben-Tovim & Walker, 1991; Boon, Vogelzang & Jansen, 2000; Jansen et al., 1998; Sackville et al., 1998). Sackville et al. (1998) controlled for cue valence by including separate lists of emotionally negative and positive words, and did not find a difference in performance between these.

Studies carried out with clinical groups have used participants with bulimia nervosa, anorexia nervosa or both. The majority of findings show that women with an eating disorder (bulimia nervosa and anorexia nervosa) are slower at colour-naming words related to -food, shape and weight compared to neutral words and compared to non-clinical women (e.g., Channon, Hemsley & de Silva, 1988; Cooper & Fairburn, 1993; Davidson & Wright, 2002; Fairburn, Cooper, Cooper, McKenna & Anastasiades, 1991; Green, McKenna & de Silva, 1994). One study (Walker, Ben Tovim, Paddick & McNamara, 1995) used coloured pictures of different female body shapes instead of words, and found that participants with an eating disorder were slower to colour-name the picture compared to a control group, although both groups were slower to colour-name the figures compared to neutral pictures of different sized balls.

However, there are some exceptions to the above findings. For

example Perpina et al. (1993) found that participants with anorexia nervosa showed an attentional bias to food-related but not shape-related words, whereas participants with bulimia nervosa showed the opposite bias (although both groups were slower at colour-naming both types of stimuli when compared to non-clinical women). In contrast, Cooper and Todd (1997) found a bias towards shape-related words in women with anorexia nervosa but not bulimia nervosa, while other studies have not discovered any attentional bias to eating-related words in participants with bulimia nervosa (see Lee & Shafran, 2004) or anorexia nervosa (Mendlewicz, Nef & Simon, 2001). A recent meta-analysis concluded that bulimic participants consistently showed an attentional bias towards both food-related and shape-related stimuli (Dobson & Dozios, 2004). In contrast, the attentional bias shown by anorexic participants is predominantly towards shape-related words, with food-related words showing only small effects.

A number of studies have investigated whether an attentional bias to food- and shape-related information decreases following treatment. They have also yielded inconsistent findings. While Cooper and Fairburn (1994) found a reduction in this processing bias after treating patients with bulimia nervosa, Black, Wilson, Labouvie and Heffernan (1997) did not replicate that finding. Carter, Bulik, McIntosh and Joyce (2000) carried out the Stroop task with participants with bulimia nervosa before and after CBT, and discovered reaction times got faster for all words, including neutral ones, suggesting a general improvement in processing speed after CBT. Lovell, Williams & Hill (1997) compared a group of individuals who had not yet received treatment to a group who had completed therapy and a control group. They found that

post-treatment bulimics and anorexics did not show an attentional bias towards food-related words, but post-treatment anorexics were still slower to colour-name shape-related words.

Given the level of inconsistency in the findings outlined above, it is necessary to consider the role of methodological factors. In particular, the pattern of findings might be due in part to the different combination of words included in the tasks. Studies that have combined both food and body shape words have tended to generate more consistent interference effects. The interference effect for solely shape-related words tends to be smaller than for solely food-related words (see Lee & Shafran, 2004; Rieger, Schotte, Touyz, Beumont & Griffiths, 1998). Furthermore, some studies do not specify how the target and neutral words were chosen and matched, particularly in terms of being emotionally and semantically similar.

It is also unclear whether the interference effects observed reflect the attentional processing of disorder-specific stimuli (as assumed), or whether they represent increased levels of arousal caused by exposure to the stimuli, which then interfere with cognitive processing. This is particularly relevant for studies that present lists each consisting of the same type of words (block presentation) rather than mixed lists (Lee & Shafran, 2004). In addition, the Stroop studies described have generally focused only on negative stimuli (with the exception of Sackville et al., 1998), so that the valence of the stimuli could be causing the interference effects, rather than the relevance of the words to eating disorders (Lee & Shafran, 2004; Rieger et al., 1998). Finally, the studies described did not control for the influence of anxiety, depression or hunger.

A study carried out by Jones-Chesters, Monsell and Cooper (1998) addresses some of these concerns. They designed a Stroop task that included both food- and shape-related words and emotional words (relating to depression and anxiety) in addition to neutral words. Participants were presented with lists of just one type of word and mixed lists, and levels of anxiety, depression and hunger were also measured. The findings indicated that women with eating disorders showed an attentional bias towards words relating to food and weight in both single and mixed word lists, although the single lists produced a greater effect. For emotional words, bulimic participants demonstrated an interference effect for the list consisting only of emotional words, but not in the mixed lists. No interference of emotional words was found for anorexic participants. The authors concluded that the specific interference for food- and shape-related words was attributable to the prioritised allocation of attentional resources (rather than cue valence or increased arousal), whereas the more general interference on a list of emotional words was attributed to a build up of arousal and not the actual stimuli itself. This seems consistent with Beck and Clark's (1997) model, where this second stage of processing involves schemas about specific threat. Increased levels of anxiety and depression (but not hunger) were also associated with greater interference effects on all types of words.

Finally, the Stroop task has also been criticised for not distinguishing between attention towards stimuli and attention away from stimuli (Rieger et al., 1998). Therefore, Rieger and colleagues used the dot probe task and included both negative and positive shape-related words and emotional words. They found that eating-disordered women tended to turn their

attention away from positive shape words and towards negative shape words. In addition, participants with anorexia nervosa tended to direct attention towards emotionally positive words, whereas participants with bulimia nervosa turned their attention away from these words. The researchers concluded that in general individuals with an eating disorder are more likely to turn their attention towards information consistent with fatness, which is hypothesised to be schema-congruent, and away from schema-incongruent information about thinness. This set of biases is likely to maintain concerns about shape and weight. They did not comment on the findings for emotional stimuli, other than implying that the findings for food- and shape-related stimuli were not due to cue valence.

3.2.2.2 General threat information

Whilst the inclusion of emotional words has allowed the potentially confounding effects of cue valence to be controlled for in studies using food- and shape-related stimuli, the words included were not ones previously associated with the eating disorders. Therefore, conclusions cannot be drawn from these studies about possible biases in attention towards emotionally threatening stimuli that reflect the core belief content found in women with eating disorders (e.g., Waller et al., 2000; 2002). Indeed, the findings of studies of subliminal processing do suggest the presence of a processing bias towards relevant threatening information, which in turn influences eating behaviour (e.g., Patton, 1992; Waller & Mijatovich, 1998).

A series of early studies found that manipulation of ego-threatening situations, such as failing a task or anticipating giving a speech, increased

eating in restrained non-clinical participants who had low self-esteem. Physically threatening situations, such as anticipating an electric shock, did not have this effect (e.g., Heatherton, Herman & Polivy, 1991).

Later studies have examined attentional biases towards relevant emotionally threatening stimuli presented at a supraliminal level, i.e. for up to two seconds. In a Stroop task, Waller, Watkins, Shuck and McManus (1996) presented non-clinical women with different forms of threat word, including physical threat, sociotropy (danger of isolation), autonomy (danger of losing personal control), and two types of ego/self-esteem threats (criticism that is self-directed and criticism from others). Women with bulimic but not restrictive attitudes demonstrated a greater attentional bias towards self-directed ego threat. Other studies have found similar effects, with non-clinical women with bulimic attitudes being slower to colour-name lists of emotionally and physically threatening words (e.g., Quinton, 1998).

Using a Stroop task with a bulimic clinical sample, McManus, Waller and Chadwick (1996) included the same threat cues as Waller et al. (1996). They found that bulimic participants were slower to colour-name all forms of threat compared to the control group. In addition, self-directed ego threats were strongly associated with a measure of bulimic psychopathology. These findings suggest a relationship between threats to self-esteem and the activation of related schemata. Therefore, they provide some preliminary evidence for a role of general psychopathology in the eating disorders, as hypothesised by the schema model (Waller, 2005; Waller et al., 2004). However, attentional bias towards self-esteem threats has not been examined using a clinical group with restrictive pathology.

3.2.3 Memory biases

Cognitive accounts of emotional disorders, particularly anxiety, have described the potential role of memory biases as another maintaining factor in psychopathology (e.g., Lee & Shafran, 2004). In emotional disorders, 'bias in memory' refers to the tendency to encode (and subsequently recall) disorder-relevant information above other types of information. In the literature, memory biases are often described alongside attentional biases, with some studies employing the same methodology such as the Stroop task. Therefore, for the purposes of this paper, studies examining biases in memory are reviewed under this second stage of processing.

3.2.3.1 Memory biases in anxiety and depression

There have been mixed findings regarding memory biases in anxious individuals, with some studies finding an enhanced recall of anxiety-related words and enhanced generation of anxious memories, while other studies fail to find this (see Wells & Matthews, 1994; Williams et al., 1997). Williams et al. (1997) cite several studies with anxious clinical groups that have found participants who showed an attentional bias in the emotional Stroop did not recognise or recall the threat-related words better than a control group in a later memory test, suggesting that there is not a straightforward relationship between attentional bias and memory bias. This also indicates that detection of a memory bias requires stimuli to be presented for a longer period of time. However the studies did find a general tendency for all participants to recognise or recall the negative words better than the neutral or positive words. It is hypothesised that the information processing system prioritises

automatic encoding of threatening stimuli rather than rehearsing this information for memory (Williams et al., 1997).

In contrast, it has consistently been found that an increased level of depressed mood (whether naturally occurring or experimentally induced) is related to a bias in recall towards mood-congruent stimuli (see MacLeod et al., 1986; Williams et al., 1997). Studies have also indicated that memory is better if the individual's mood at encoding and retrieval are similar, and if a stimulus that has affective content is congruent with mood at encoding or retrieval (see Wells & Matthews, 1994; Williams et al., 1997). Other factors found to enhance memory include: intentional rather than incidental learning; free recall compared to recognition; and real-life memories, rather than experimental materials.

3.2.3.2 Memory biases in the eating disorders

Only a few studies have examined memory biases in the eating disorders. In one, individuals with an eating disorder recalled more shape-related words than neutral words, and more than non-clinical women (Sebastian, Williamson & Blouin, 1996). However levels of depression and cue valence were not controlled for in this study, so it is unclear whether there is a general memory bias towards all negative information or just disorder-relevant stimuli (Lee & Shafran, 2004). Hermans, Pieters & Eelen (1998) found that individuals with anorexia nervosa recalled more anorexia-related words compared to general negative and control words. In addition to women with an eating disorder, non-clinical restrained eaters and obese women have also demonstrated biases for recalling both food- and weight-

related information (King, Polivy & Herman, 1991). These studies provide some evidence for the existence of an explicit memory bias towards disorder-related words (Lee & Shafran, 2004). However, one study did not find a difference in recognition for food- or shape-related words between participants with anorexia nervosa and a control group (Channon et al., 1988).

3.2.4 Summary

Overall, individuals with high levels of eating pathology demonstrate an attentional bias towards disorder-specific information and towards general threat, particularly threats to self-esteem. Whilst this bias has been found less consistently in non-clinical groups with high levels of eating pathology, the picture is somewhat clearer for clinical groups. Women with an eating disorder have also shown a memory bias towards disorder-specific information. However, the time taken to encode this information remains unclear. These findings are compatible with Beck and Clark's (1997) information-processing model, which hypothesises that this stage of processing is driven by schemas that appraise threat, and that threat-related information is processed rapidly. The schema model of the eating disorders would predict that these findings reflect the activation of both disorder-specific cognitions and more general threat-related schemata (Waller, 2005), whereby attention is directed towards schema-congruent information, and schema-consistent memories are then formed.

3.3 Secondary activation of elaborative and reflective modes

Two types of more elaborative processing are important in the maintenance of an eating disorder - cognitive avoidance and attributional style. Cognitive avoidance occurs when an individual avoids attending to threatening stimuli. It can be seen as a defensive mechanism against intolerable affect, which results in threatening information being processed more slowly (e.g., Ainsworth et al., 2002). This may reflect a 'schema avoidance' coping style, as described by Young et al. (2003). Studies that have demonstrated such an effect have tended to use tasks that involve more explicit and strategic processing, in keeping with the proposal that cognitive avoidance occurs at a later stage of processing (Ainsworth et al., 2002).

In contrast, attributional style refers to an individual's assumptions regarding the causality of an event or behaviour (Försterling, 2001). Individuals explain causality along a variety of dimensions, including personalisation, pervasiveness and stability. The most widely studied explanation is personalisation, with internal explanations attributing responsibility within the person (such as motivation and ability) and external explanations attributing responsibility within the environment. Causal attributions can impact on an individual's mood and self-esteem, and are considered increasingly important in the eating disorders (Waller et al., 2004). They may reflect a type of 'schema surrender' coping style (Young et al., 2003). Given its evaluative nature, attributional biases are considered here under the elaborative stage of processing.

3.3.1 Cognitive avoidance in anxiety

It has been suggested (e.g., de Ruiter & Brosschot, 1994) that the interference effects observed on the Stroop task in anxious individuals might actually reflect a motivation towards cognitive avoidance, which requires an initial attentional bias towards the threatening information (rather than reflecting attentional bias per se). This explanation would place cognitive avoidance at an earlier stage of processing. However this hypothesis does not account for interference effects with positive stimuli or the observed memory bias towards threatening information (Williams et al., 1997). Although there is limited research examining cognitive avoidance in anxiety, it is generally agreed that anxious individuals actively avoid thinking about anxiety-provoking situations (Ainsworth et al., 2002; Beck & Clark, 1997).

3.3.2 Cognitive avoidance in the eating disorders

A small body of research has examined cognitive avoidance in the eating disorders. Waller, Quinton and Watson (1995) used a task that involved participants identifying whether a previously presented stimulus word (threat or neutral) was present or absent in an array of words. They found that non-clinical women with high levels of bulimic attitudes were slower to respond to threat-related stimuli compared to neutral stimuli, which could be attributed to cognitive avoidance. In addition, these women were more likely to correctly identify a threat word as being present rather than absent. The researchers suggest this reflects an expectation in these women that threat will be present in the environment.

It has been suggested that the apparent cognitive avoidance found in

this study could be due to the preferential allocation of processing resources to the initial presentation of the stimulus word, given its personal relevance (Waller & Meyer, 1997). Waller and Meyer (1997) used a different task to examine the process of cognitive avoidance, asking non-clinical participants to solve anagrams of neutral, food and threatening words (physical threat, self-directed ego/self-esteem threat, and ego threat from others). The findings did not provide support for a relationship between slower processing of threat and different eating characteristics (as measured by the Eating Disorder Inventory - EDI; Garner, 1991), such as bulimic or restrictive attitudes. However, an association was found between slower processing of self-directed ego threat and dimensions of the EDI reflecting poorer ego development. Meyer et al. (in press) have replicated and extended these findings with a clinical bulimic group. They also included food-related stimuli, but did not find evidence of cognitive avoidance of this type of information.

One study of a non-clinical group has attempted to measure cognitive avoidance using the emotional Stroop (Seddon & Waller, 2000). Avoidance was assumed if the individual was quicker to colour-name emotional words compared to neutral words, as it was hypothesised that the actual meaning of the threatening stimuli was not attended to. Seddon and Waller concluded that processing style varies with age, since they found that younger women with high levels of bulimic attitudes showed greater cognitive avoidance of both negative and positive cues, whereas older women demonstrated an attentional bias towards negative stimuli.

As the studies described so far have been carried out with non-clinical women, generalisations to a clinical population should be made with caution.

In an unpublished study, Heath (2004) used the dot probe task to examine cognitive avoidance in individuals with restrictive and bulimic pathology. The results indicated that restrictive pathology was associated with attention away from threat, while bulimic pathology was associated with attention toward threat. This supports the theory that restrictive pathology involves avoidance of negative affect through cognitive processing, whereas bulimic pathology reflects behavioural attempts to reduce awareness of negative affect once it has been triggered (Waller, 2005). However, this study presented stimuli for less than two seconds suggesting that cognitive avoidance may occur at an earlier stage of processing in individuals with restrictive pathology.

Quinton (2004) replicated the methodology used by Waller et al. (1995), but included the threat words used by McManus et al. (1996) to compare the response time of eating-disordered women and a control group. The results did not indicate a difference in the detection of threatening information between women with bulimia nervosa, anorexia nervosa and the control group. The researcher hypothesised that threat might also be relevant to non-clinical women, and might reflect their levels of eating pathology (which was not controlled for in this study). However, bulimic and anorexic women were slower to detect the presence of some threat-related stimuli than the neutral stimuli, suggesting that avoidance of threat is to some degree relevant in all types of eating disorder, not just restrictive pathology.

Pulling these findings together, it can be hypothesised that women with high levels of eating pathology, particularly bulimic attitudes, are oriented to automatically identifying threat (manifesting as attentional bias). However, when they are required to actively identify threat, they tend to avoid doing so

(manifesting as cognitive avoidance) (e.g., Waller & Meyer, 1997). In addition to the nature of the task and the individual's eating pathology (i.e., bulimic or restrictive), the process being observed (i.e., attentional bias or cognitive avoidance) may also depend in part on temporal factors, such as the length of time given to process information (Meyer, Waller & Watson, 2000). It may also be a product of the need for more strategic processing (Meyer et al., in press). Thus, it appears that an initial stage of rapid processing involving an attentional bias towards threat is followed by slower processing involving cognitive avoidance of the stimuli (Ainsworth et al., 2002). Therefore, attentional bias and cognitive avoidance are not incompatible processes. Both may serve to maintain underlying negative schemas that are not directly related to food, shape and weight, as proposed by the schema model (e.g., Waller, 2005; Waller et al., 2004).

Similar processes to cognitive avoidance have been studied in the eating disorders, including 'escape from awareness', blocking and dissociation (see Ainsworth et al., 2002). In brief, escape from awareness models state that high levels of distress lead to cognitive narrowing, whereby awareness of the immediate environment is reduced (Heatherton & Baumeister, 1991). The consequence of this reduction is behavioural disinhibition, manifesting as less control over eating. The blocking model proposes that binge eating serves the more direct function of reducing the intolerable emotional states caused by negative life events (e.g., Lacey, 1986). Dissociation is a separation of mental processes that are usually integrated (e.g., Spiegel & Cadeña, 1991). It is a common phenomenon in the eating disorders (e.g., Demitrack, Putnam, Brewerton, Brandt & Gold,

1990; Vanderlinden, Vandereycken, van Dyck & Vertommen, 1993). It has been conceptualised both as a defensive response to intolerable cognitions about the self that occur during a binge and as a trigger to binge eating, with the binge functioning to reduce the feelings of detachment caused by dissociation (see Ainsworth et al., 2002).

3.3.3 Attributional biases

It has been suggested that attributions are guided by beliefs and previous experience about what factors cause an event to occur (Försterling, 2001). In non-clinical populations, a number of attributional biases have been identified. First, information that is inconsistent with one's beliefs is often discounted (see Försterling, 2001). Second, there is a general preference to make internal attributions (Gilbert & Malone, 1995), particularly if it is regarding one's own behaviour. Finally, there is a tendency for one's own successes to be attributed to internal factors, while failure is related to external factors. This has been labelled as a 'self-serving bias', and is central in the promotion of positive self-esteem (Kelley & Michela, 1980). The attributional process also serves the function of promoting a sense of predictability and personal control (Försterling, 2001). Although most of the research findings are based on paradigms that force participants into making an attribution, there is evidence of spontaneous attributional processes in studies that examine participants' written or verbalised thoughts (Försterling, 2001).

3.3.3.1 Attributional bias in depression and psychosis

Attributional biases have been studied predominantly in depression and psychosis, through the use of self-report measures describing hypothetical situations. In contrast to the pattern in non-clinical individuals (see above), individuals with depressive symptoms are more likely to attribute negative outcomes to internal factors, even if these outcomes were uncontrollable, and attribute positive outcomes to external factors (Abramson, Seligman & Teasdale, 1978; Brewin, 1985). This is commonly referred to in the literature as a 'negative attributional style', which the hopelessness theory of depression has identified as a potential vulnerability factor (Abramson, Metalksky & Alloy, 1989). Subsequent studies have supported these findings. Those employing a prospective design suggest that a negative attributional style often precedes the onset of depressive symptoms (Försterling, 2001), suggesting a possible causal relationship. In general, these findings suggest that individuals with depression fail to experience the self-serving bias that helps protect against low self-esteem and promotes a sense of personal control over events.

In contrast, people experiencing persecutory delusions attribute negative events externally and tend to attribute positive outcomes internally (Garety & Freeman, 1999). This attributional style reflects an extreme form of the self-serving bias. Some more recent studies have separated external factors into two distinct explanations - other people and the situation (e.g., Kinderman & Bentall, 1997). Those studies have shown that individuals experiencing persecutory delusions have a tendency to attribute the blame for negative events to other people rather than to the situation. It has yet to

be established whether this attributional bias is a predisposing factor, maintaining factor or consequence of such delusional ideation.

3.3.3.2 Attributional bias in the eating disorders

Research into attributional style in the eating disorders has found that women in this group tend to make internal attributions for negative events, compared with women without an eating disorder (Dalglish et al., 2001; Goebal, Spalthoff, Schulze & Florin, 1989; Schlesier-Carter, Hamilton, O'Neil, Lydiard & Malcolm, 1989). However, they do so to a lesser extent than women with depression (Mansfield & Wade, 2000). Furthermore, individuals with binge eating disorder are also more likely to make internal attributions regarding the causes of a binge (Watkins et al., 2001). Research carried out with female university students has found that women who have a tendency to attribute failure to internal factors have a higher likelihood of being preoccupied with restrictive eating (Watt, Sharp & Atkins, 2002). In general, these findings suggest that individuals with high levels of eating pathology tend to adopt the negative attributional style found in depression, though not as intensely as in mood disorders.

The co-occurrence of depressive symptoms and eating pathology is widely documented (e.g., Fornari et al., 1992), suggesting that levels of depression might influence the apparent presence of a negative attributional style in the eating disorders. For example, Metalksy et al. (1997) found that bulimics with a negative attributional style for negative events have higher levels of depressive symptoms compared to bulimics with a positive attributional style. Levels of depressive symptoms and negative attributional

style are also correlated amongst women with bulimic symptoms (Goebal et al., 1989; Schlesier-Carter et al., 1989). When levels of depressive symptoms are controlled for, differences in negative attributional style between eating-disordered and non-clinical women disappear (Dalglish et al., 2001; Schlesier-Carter et al., 1989).

These studies suggest that depressive symptoms and a negative attributional style are related in women with high levels of eating pathology. However, the direction of this relationship is unclear. It is possible that the depression is a consequence of the bulimic features, rather than vice versa.

To address this point, Joiner, Metalsky and Wonderlich (1995) used a prospective design with female university students. In participants with a negative attributional style, the presence of bulimic symptoms was associated with increases in depressive symptoms three weeks later. However, this pattern did not occur in women who adopted a positive attributional style to negative events or who did not report bulimic symptoms. Furthermore, a negative attributional style and depressive symptoms did not predict an increase in bulimic symptoms three weeks later. This suggests that a negative attributional style is a risk factor for depressive symptoms in individuals with bulimic symptoms. However, these findings require replication with longer time lags (Joiner et al., 1995) and a clinical population. Regardless, if a negative attributional bias is found in those who are comorbidly depressed and eating-disordered, then it is likely to be important to address the cognitive construct (attributional style) in order to treat both disorders, rather than assuming that the comorbidity with depression means that one should discount the role of attributional style.

With regards to positive situations, Mansfield and Wade (2000) found that women with atypical eating disorders have a greater tendency to give external attributions in these situations compared to non-eating-disordered women and depressed women. However these findings have not been supported by other studies (Dalglish et al., 2001; Watt et al., 2002). Cooper (1997) investigated the use of weight- and shape-related explanations for negative and positive outcomes, and found that women with an eating disorder are more likely to use internal explanations for negative events than non-clinical women. In contrast, positive events were more likely to be attributed to other people.

Previous studies of attributional style in the eating disorders have not distinguished the nature of external attributions made. This is despite the widespread recognition that external attributions can be either situational (attributed to the circumstance) or personal (attributed to the behaviour of others) (Kinderman & Bentall, 1996). The importance of making this distinction becomes apparent from research (e.g., Kinderman & Bentall, 2000) linking the tendency to make external-personal attributions regarding negative events to the belief that others negatively appraise the self. Conversely, external-situational attributions have been associated with the belief that others hold positive views about the self (Kinderman & Bentall, 2000).

A recent study addressed this gap in the eating disorders literature by separating external factors into the two distinct explanations - other people and the situation (Foster, Lawson & Waller, 2005). This study also examined attributions for negative and positive events. The findings indicated that the

control group tended to demonstrate the self-serving attributional bias common among non-clinical populations (see above), whereas the restrictive group tended to attribute negative events to internal factors and positive events to situational factors (but not to other people). While the bulimic group also attributed negative events to internal factors, they were found to have a healthier attributional style than restrictive individuals, maintaining an internal attribution for positive events. The researchers did not find a relationship between attributional style and strength of different eating characteristics (as measured by the EDI; Garner, 1991), suggesting attributional style is independent of severity of eating pathology. It should be noted that this study did not control for levels of depression.

3.3.4 Summary

Both cognitive avoidance and the attributional process appear to involve a more intentional, strategic and evaluative style of processing following the identification of threat. This reflects the secondary activation stage of processing described by Beck and Clark (1997) and the potential activation of general threat-schemata (Waller, 2005).

The research on cognitive avoidance indicates that individuals with high levels of eating pathology, particularly restrictive pathology, tend to direct their attention away from threat-related information. The relevant threat appears to be one targeted towards self-esteem rather than disorder-specific information. This apparent cognitive avoidance has been explained by a number of models as functioning to avoid the experience of negative affect. With regards to the attributional process, individuals with an eating disorder

demonstrate the negative attributional style that is characteristic of depression. While the relationship between attributional biases and depression in the eating disorders remains somewhat unclear, research has indicated that a negative attributional style might be a vulnerability factor for later depression in women with an eating disorder.

3.4 Overall summary

Beck and Clark (1997) describe the information-processing characteristics of the three stages involved in the processing of threat in anxiety disorders. The initial registration stage involves rapid, preconscious processing of potentially threatening information. Research in the eating disorders suggests that there is evidence of this type of preconscious processing towards disorder-relevant and general threat in non-clinical women with high levels of eating pathology.

The second, primal threat, stage in Beck and Clark's model occurs at a more conscious level, but is still rapid and involuntary. Processing resources are focused on specific forms of threat. In the eating disorders, research has predominantly found that disorder-specific threat or threats to self-esteem are attended to and recalled above other types of information. This is consistent with the specificity of this stage of processing.

Finally, Beck and Clark describe the third, elaborative and reflective, stage of processing as more intentional. Research suggests that cognitive avoidance and attributional biases are two strategies involved in the eating disorders at this stage, and that the processing of general threat may be more prominent than disorder-relevant threat.

The schema model of eating disorders (Waller, 2005) suggests that the biases in threat processing that occur at each of these stages are driven by the core belief content. In turn, the priority given to threat-related information and the evaluation of this threat supports and therefore maintains the core beliefs. In addition, the pathological eating behaviours used to cope with schema activation are also maintained. The influence of core belief content accounts for the biases in processing towards general threat that are unrelated to concerns about food, shape and weight.

4. Clinical Implications

Based on their information-processing model, Beck and Clark (1997) suggest the treatment of anxiety disorders should involve two elements - deactivating the primal threat mode to reduce its influence, and strengthening the elaborative and reflective modes to reinforce the impact of this stage of processing. They also claim that, since therapy teaches patients strategies to reflect on their anxious thoughts rather than suppress them, elaborative processes (making sense of threat) can override initial automatic processes (involving the registration of threat). Therefore, they recommend the use of verbal strategies that involve the evaluation of anxious thoughts, in addition to behavioural strategies such as exposure.

Within the eating disorders, there will be everyday information processing biases that serve to maintain the pathology. These include a tendency to identify and process threatening information related to food and body shape, which is likely to contribute to an individual's preoccupation with these concerns, and consequently perpetuate the eating disorder (e.g., Lee &

Shafran, 2004). In addition, there will be biases towards processing more general threat cues that are unrelated to eating concerns (such as information relating to self-esteem and abandonment), and these biases are likely to maintain core belief content (e.g., Waller, 2005). It is important that clinicians are aware of the roles played by such information processing biases in the maintenance of an eating disorder.

In light of these characteristics, psychological therapies for the eating disorders should not focus solely on reducing superficial concerns about food, body shape and weight, as emphasised by traditional cognitive-behavioural models (e.g., Fairburn, 1997). Those therapies should also consider deeper levels of cognitions, since such beliefs and biases have been found to influence eating pathology (e.g., McManus et al., 1996; Meyer & Waller, 1999; Quinton, 2004; Waller & Meyer, 1997). Specifically, clinicians might need to increase the patient's repertoire of reflective and evaluative strategies, to reduce their biases towards processing threatening information in an unhelpful way. In turn, this should make the patient less likely to resort to eating-disordered behaviours to cope with difficult situations and feelings, such as using bingeing behaviour to reduce negative affect (see McManus et al., 1996).

These information-processing biases are also likely to occur during therapy (Ainsworth et al., 2002). For example, if a patient has the belief that people will abandon or criticise them, they will tend to perceive, recall and interpret relatively neutral information (e.g., the therapist being five minutes late for a session) as a sign that this is happening again. If they have a negative attributional style, then they are likely to blame the self for this

negative occurrence and are less likely to raise their concerns in therapy. They might also adopt strategies to avoid talking about emotionally threatening topics. Therapists could openly pre-empt such biases and use these in-session examples to examine and challenge this way of processing information.

5. Implications for Future Research

This review has examined the different cognitive biases that have been identified in the processing of threat in the eating disorders. The schema model predicts that underlying core beliefs drive these cognitive processing biases, which in turn confirm the core belief content (Waller, 2005). Future research is needed to determine the actual links between cognitive processes and core belief content in the eating disorders. The processing of emotionally positive information that is semantically relevant to the eating disorders (e.g., related to self-esteem) also remains unclear, and warrants further investigation.

Researchers have started to speculate about the links between different cognitive processes (e.g., Ainsworth et al., 2002; Quinton, 2004). Understanding the potential relationships between these processes would be useful in determining the independent and accumulative importance of each in the maintenance of eating pathology. This has important clinical implications regarding the priority given to the different cognitive processing biases in therapy.

In addition to examining the potential stages of threat processing in the eating disorders, this review has highlighted the similarities in information

processing between the eating disorders and other psychological problems, such as anxiety and depression. Given these similarities, it would be useful for future research to examine threat processing in individuals with co-morbid anxiety or depression to determine the similarities and differences to threat processing in individuals without co-morbidity. This would have obvious implications for determining which cognitive biases to address in therapy.

The majority of studies examining threat processing in the eating disorders have employed a retrospective design. While this has allowed for links to be established between cognitive processing biases and levels of eating pathology, issues of causality remain unclear. Future studies employing a prospective design would be useful in determining whether biases in threat processing play a causal role in the eating disorders (Lee & Shafran, 2004).

6. Conclusions

Traditional cognitive-behavioural models of the eating disorders have emphasised the central role of concerns about food, body shape and weight. However, the only partial success of treatment based on this approach has led to new developments in understanding the eating disorders. The schema model highlights the importance of cognitive processing of threat (in addition to the content of core beliefs) in the maintenance of an eating disorder. This review has discussed the possible stages and nature of such threat processing in the eating disorders, and the potential biases that occur at each stage. Evidence indicates that in individuals with high levels of eating pathology, biases occur not only in the processing of information related to

food and body shape but also in the processing of emotional information unrelated to these concerns. Further research is needed to increase the clinical relevance of these findings, and to tie these different processing biases into the schema model of eating disorders.

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Part 2: Empirical Paper

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Abstract

This study examined attentional bias to threat and attributional style in the eating disorders. An emotional Stroop task was employed as a measure of attentional bias. The Internal, Personal and Situational Attributions Questionnaire (IPSAQ) was used to measure attributional style. There were no differences between eating-disordered and non-clinical women in levels of attentional bias to self-esteem threat or positive cues. As predicted, women with an eating disorder demonstrated an internal attributional style for negative events, despite levels of depressed mood. There were no differences between the groups in attributional style for positive events. Furthermore, there was not a relationship between attentional bias to threat and attributional style in either group. The findings are examined in relation to the schema model of eating disorders and the stages of threat processing model. The clinical implications and the need for further research in this area are discussed.

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Early cognitive conceptualisations of the eating disorders focused on the role of disorder-specific cognitions about weight, body shape and food (e.g., Fairburn, Cooper & Cooper, 1986). In this model, the central cognitive characteristic is an extreme concern about weight and shape. Weight control behaviours are seen as consequences of these central concerns, and binge eating is a product of the inevitable breaking of strict dietary rules.

There is evidence that cognitive behavioural therapy (CBT) based on this model is partially successful with specific groups – particularly uncomplicated bulimia nervosa and binge-eating disorder (Fairburn & Harrison, 2003; National Institute for Clinical Excellence, 2004). However, there is less evidence of effectiveness with anorexia nervosa or atypical eating disorders that do not meet full diagnostic criteria (Fairburn & Harrison, 2003; Vitousek, 1996; Waller & Kennerley, 2003), suggesting this model is not sufficient to explain or treat the range of eating psychopathologies (Fairburn, Cooper & Shafran, 2003; Waller, Dickson & Ohanian, 2002; Waller, Ohanian, Meyer & Osman, 2000).

In light of this, cognitive theories of the eating disorders have begun to draw on the schema model, originally described by Young (1994). This model focuses on an individual's early experiences, long-standing beliefs, and the processes that maintain those beliefs. The schema model assumes that both general psychopathology and specific eating pathology play a role in the development and maintenance of an eating disorder (e.g., Waller, 2005;

Waller, Kennerley & Ohanian, 2004).

Schema Model of the Eating Disorders

Young (1994) describes early maladaptive schemas as accurate representations of childhood experiences that become less reality-based and more self-defeating over time. They consist of unconditional core beliefs (about the self, others and the future) and schema processes (i.e., schema surrender, compensation and avoidance; Young, Klosko & Weishaar, 2003). These processes are driven by and maintain the core belief content.

Within the eating disorders, a number of core beliefs have been identified that are unrelated to concerns about food, shape and weight. These include perceptions of the self as being flawed, dependent, unsuccessful, lacking in control, deprived of emotional support and socially different to others, and the belief that expressing emotions will result in adverse consequences (e.g., Waller et al., 2000; 2002). Research in the eating disorders has also begun to identify biases in the processing of information. It is hypothesised that these biases are driven by core belief content and are manifestations of the schema processes (e.g., Waller, 2005).

Information Processing Biases in the Eating Disorders

Beck and Clark (1997) propose that in anxiety disorders, threat is processed in three stages and information-processing research in the eating disorders can also be broadly categorised into these. The first stage involves the initial automatic registration of the stimulus. Processing at this stage is rapid and occurs outside conscious awareness. Research in the eating

disorders has employed subliminal methods to examine preconscious processing (e.g., Jansen, Huygens & Tenney, 1998; Meyer & Waller, 1999; Patton, 1992; Sackville, Schotte, Touyz, Griffiths & Beumont, 1998; Schotte, McNally & Turner, 1990; Waller & Mijatovich, 1998).

The second stage involves the activation of the primal threat mode, where the stimulus is identified as threatening. Processing is also rapid and involuntary, although the individual will be aware of the cognitive, affective, behavioural and physiological consequences of the threat appraisal. Studies in the eating disorders have employed supraliminal methods such as the Stroop task (Stroop, 1935) and the dot probe task (MacLeod, Mathews & Tata, 1986) to examine attentional biases (see below). Memory biases have also been studied (e.g., Channon, Hemsley & De Silva, 1988; Hermans, Pieters & Eelen, 1998; King, Polivy & Herman, 1991; Sebastian, Williamson & Blouin, 1996).

The third stage involves the secondary activation of elaborate and reflective modes. Processing at this stage is more intentional and strategic, using personal schemas and contextual information to evaluate the stimulus. Research in the eating disorders has employed methods such as solving anagrams and word-searching tasks to examine cognitive avoidance (e.g., Meyer et al., in press; Quinton, 2004; Seddon & Waller, 2000; Waller & Meyer, 1997; Waller, Quinton & Watson, 1995). It has also used questionnaires to examine attributional biases (see below).

Researchers have started to speculate about the links between these different processing biases (e.g., Ainsworth, Waller, & Kennedy, 2002; Quinton, 2004). Understanding the potential relationships between them

would be useful in determining the importance of each in the maintenance of eating pathology. It would also provide support for the schema model of eating disorders, which hypothesises that these different cognitive processes are driven by and maintain core belief content (Waller, 2005). In light of this, the current study focuses on two cognitive processes that have been studied, but not linked together, in the eating disorders - attentional bias and attributional style.

Attentional Biases in the Eating Disorders

Research on attentional bias in the eating disorders can be separated into findings for food- and shape-related stimuli (disorder-specific information), and findings for emotional stimuli (general threat information).

With regards to disorder-specific stimuli, studies employing a non-clinical sample have found a relationship between unhealthy eating attitudes and an attentional bias towards such stimuli (Davidson & Wright, 2002; Green & Rogers, 1993; Perpina, Hemsley, Treasure & de Silva, 1993). Other studies have not fully replicated these findings (Ben-Tovim & Walker, 1991; Boon, Vogelzang & Jansen, 2000; Jansen et al., 1998; Sackville et al., 1998).

The majority of findings with clinical groups show that women with an eating disorder demonstrate an greater attentional bias towards words relating to food, shape and weight, compared to non-clinical women (Channon et al., 1988; Cooper & Fairburn, 1993; Davidson & Wright, 2002; Dobson & Dozios, 2004; Fairburn, Cooper, Cooper, McKenna & Anastasiades, 1991; Green, McKenna & de Silva, 1994; Jones-Chesters, Monsell & Cooper, 1998; Rieger, Schotte, Touyz, Beumont & Griffiths, 1998),

although there are some exceptions to these findings (e.g., Cooper & Todd, 1997; Mendlewicz, Nef & Simon, 2001; Perpina et al., 1993).

With regards to general threat, Waller, Watkins, Shuck and McManus (1996) presented non-clinical women with different forms of threat including physical, sociotropy (danger of isolation), autonomy (danger of losing personal control), and two types of ego/self-esteem threat (criticism that is self-directed and criticism from others). Women with bulimic but not restrictive attitudes demonstrated a greater attentional bias towards self-directed ego threat. Other studies have supported this finding (e.g., Quinton, 1998).

Using the same threat cues as Waller et al. (1996) but with a clinical sample, McManus, Waller and Chadwick (1996) found that bulimic participants demonstrated a greater attentional bias towards all forms of threat compared to non-clinical women, but particularly self-directed ego/esteem threat. There is a lack of evidence regarding attentional bias to self-esteem threat amongst individuals with restrictive pathology, although studies examining cognitive avoidance suggest restriction is related to an avoidance of threat (e.g., Heath, 2004). The processing of emotionally positive cues that are semantically relevant to the eating disorders (e.g., related to self-esteem) also remains unclear.

To summarise, the above research suggests that individuals with high levels of eating pathology demonstrate an attentional bias towards disorder-specific information and general threat, particularly threats to self-esteem. These findings are compatible with Beck and Clark's (1997) second stage of threat processing, involving threat appraisal. The schema model of the eating

disorders would predict that these findings reflect the activation of both disorder-specific cognitions and more general threat-related schemata (Waller, 2005). Whilst research on attentional bias provides insight into the type of stimuli individuals with an eating disorder are more likely to process, it does not examine what sense they make of this information. Research into attributional style examines a key process in how individuals evaluate their environment.

Attributional Style in the Eating Disorders

In non-clinical populations, a self-serving bias has been identified whereby positive outcomes are attributed to internal factors and negative outcomes to external factors (Kelley & Michela, 1980). In contrast, individuals with depressed mood demonstrate a more negative attributional style, in that they attribute negative outcomes to internal factors and positive outcomes to external factors (Brewin, 1985; Abramson, Seligman & Teasdale, 1978).

In the eating disorders, research has found that women with an eating disorder show a greater bias towards making internal attributions for negative outcomes, compared to non-clinical women (Dalglish et al., 2001; Goebal, Spalthoff, Schulze & Florin, 1989; Schlesier-Carter, Hamilton, O'Neil, Lydiard & Malcolm, 1989). However, they do so to a lesser extent than women with depression (Mansfield & Wade, 2000).

The co-occurrence of depressive symptoms and eating pathology is widely documented (e.g., Fornari et al., 1992), and some studies have found that depressive symptoms and a negative attributional style are related in the eating disorders (e.g., Dalglish et al., 2001; Goebal et al., 1989; Metalksy et

al., 1997; Schlesier-Carter et al., 1989), although the direction of this relationship is unclear. It has been suggested that a negative attributional style is a specific risk factor for depressive symptoms in non-clinical women with bulimic symptoms (Joiner, Metalsky & Wonderlich, 1995), although these findings require replication with longer time lags and a clinical population.

With regards to positive outcomes, Mansfield and Wade (2000) found that women with an atypical eating disorder have a greater bias towards making external attributions, compared to non-eating-disordered women and depressed women. However, these findings have not been supported by other studies (Dalglish et al., 2001; Watt, Sharp & Atkins, 2002).

Previous studies of attributional style in the eating disorders have not distinguished the nature of external attributions made, despite the recognition that external factors can be either situational (attributed to the circumstance) or personal (attributed to the behaviour of others) (Kinderman & Bentall, 1996). The importance of making this distinction becomes apparent from research into paranoia (e.g., Kinderman & Bentall, 2000), where a bias towards external-personal attributions for negative outcomes has been related to the belief that others negatively appraise the self. Conversely, external-situational attributions have been associated with the belief that others hold positive views about the self (Kinderman & Bentall, 2000).

A recent study addressed this gap in the eating disorders and found that individuals in the restrictive group attributed positive events to situational factors (but not others) while the bulimic group maintained an internal attribution for positive events (Foster, Lawson & Waller, 2005). This study

also replicated previous findings in that both groups of eating-disordered women attributed negative events to internal factors and non-clinical women demonstrated the self-serving bias described above. However, levels of depressed mood were not controlled for in this study.

To summarise, research on attributional style suggests that when evaluating information, individuals with an eating disorder tend to blame themselves for negative outcomes and to some extent attribute positive outcomes to the situation. Therefore, they demonstrate a negative attributional style. This evaluative style of processing reflects the secondary activation stage of processing described by Beck and Clark (1997), and the potential activation of general schemata (Waller, 2005).

Current Study

The schema model of eating disorders hypothesises that information-processing biases, such as attentional biases and attributional biases, are driven by core belief content (Waller, 2005). This suggests there should be a dimensional relationship between these processes. Specifically, individuals who notice potentially negative information would be more likely to blame the self for this when evaluating it's meaning, thus reflecting negative underlying beliefs about the self. Based on the schema model, it could also be hypothesised that individuals who notice positive information are more likely to attribute this to the self, thus reflecting more positive underlying beliefs about the self.

The purpose of the current study is to examine the relationship between these two processing biases in the eating disorders. It will also

examine the impact of depressed mood and severity of eating pathology.

Aims and Hypotheses

This study aims to determine levels of attentional bias to threat and attributional style in the eating disorders, and links with depressed mood and eating pathology. Based on previous research (e.g., Dalglish et al., 2001; Foster et al., 2005; McManus et al., 1996), it is hypothesised that:

- 1) Higher levels of depressed mood will be associated with a more negative attributional style in women with an eating disorder and in non-clinical women;
- 2) Women with an eating disorder will demonstrate a greater attentional bias towards self-esteem threat and a more negative attributional style than non-clinical women;
- 3) Higher levels of eating pathology will be associated with a greater attentional bias towards self-esteem threat and a more negative attributional style in women with an eating disorder and in non-clinical women.

This study also aims to determine the relationship between attentional bias to threat and attributional style. Based on the schema model's prediction that different processing biases are driven by and maintain core belief content (e.g., Waller, 2005), it is hypothesised that:

- 4) A negative attributional style will be associated with a greater attentional bias towards self-esteem threat in women with an eating disorder and in non-clinical women.

Method

Design

There were two participant groups in this study: a clinical group and a control group. This study employed a between-groups design to examine differences in attentional bias and attributional style. This study also used a correlational design to examine associations between depressed mood, eating pathology, attentional bias and attributional style.

Participants

A total of 51 participants took part in the study. Due to the low number of males presenting at eating disorders services, this study was limited to females. Based on the results of McManus et al. (1996), power analysis (using Gpower; Erfelder, Faul, & Buchner, 1996) based on 70% power with a 0.05 significance level, indicated that there should be a total sample size of 48.

Clinical Group. These participants were recruited from a South London outpatient eating disorders service. They were approached following their assessment, or during the early stages of treatment if they had met DSM-IV criteria for an eating disorder within the last two months. Experienced clinicians made the diagnosis using a semi-structured interview. Forty-two women were approached to take part in the study. Of these, 4 declined to take part, 9 took the information sheet but did not contact the researcher and 4 did not attend an arranged appointment. Therefore, this group consisted of 25 women, who met DSM-IV criteria for an eating disorder (American

Psychiatric Association (APA), 1994). Exclusion criteria for the clinical group included co-morbid drug or alcohol addiction, psychotic illness and learning disability.

The proportions of participants representing the individual diagnoses were: 4 bulimia nervosa purging subtype, 3 bulimia nervosa non-purging subtype, 2 anorexia nervosa, 1 bulimic anorexia and 15 eating disorder not otherwise specified (EDNOS). However these diagnostic groups were not differentiated in the analysis, in keeping with recent research developments towards a transdiagnostic approach (e.g., Fairburn et al., 2003). The mean age of the clinical group was 27.32 years (SD = 6.97). The mean body mass index (BMI) was 20.34 (SD = 3.25).

Control Group. These participants were recruited from a non-student population, through opportunity sampling of work and personal contacts. Twenty-seven women were approached to take part in the study and all agreed to participate. None had received a past or current diagnosis of an eating disorder. The Eating Disorders Examination Questionnaire (see below) was also used to indicate the potential presence of an eating disorder. Based on this, one participant was excluded as they scored above the clinical cut-off. Therefore, this group consisted of 26 women. Exclusion criteria for the control group also included co-morbid drug or alcohol addiction, psychotic illness and learning disability. The mean age of the control group was 27.73 (SD = 5.62). The mean body mass index (BMI) was 22.1 (SD = 2.04).

Measures

Internal, Personal and Situational Attributions Questionnaire (IPSAQ). The IPSAQ (Kinderman & Bentall, 1996) is a self-report measure of general attributional style (see Appendix I). It consists of 32 items, 16 describing a positive event and 16 describing a negative event. Participants are asked to write a causal explanation for the event and to then indicate whether the attribution is internal (their own disposition), personal (another person) or situational (the situation). The total number of each type of attribution is summed independently for positive and negative items, resulting in six subscales: internal attribution for negative events; personal attribution for negative events; situational attribution for negative events; internal attribution for positive events; personal attribution for positive events; situational attribution for positive events.

Two composite scores are computed from these initial subscales: externalizing bias (EB) and personalizing bias (PB). The EB is the 'internal attribution for positive events' score minus the 'internal attribution for negative events' score. The lower the EB score, the greater the tendency to attribute negative events to the self, relative to positive events. The PB indicates the proportion of personal attributions for negative events, relative to situational attributions. The 'personal attribution of negative events' score is divided by the sum of the scores for the 'personal attribution of negative events' and the 'situational attribution of negative events.' A PB score of more than 0.5 represents a tendency to attribute negative events to others.

In this study, the IPSAQ was chosen as the measure of attributional style in preference to the Attributional Style Questionnaire (ASQ; Peterson et

al., 1982). The reliability of the individual subscales of the ASQ has not been satisfactorily established (e.g., Reivich, 1995) and it does not distinguish between personal and situational attributions on the external dimension (Kinderman & Bentall, 1996).

Associations between the IPSAQ and ASQ scales for the internal dimension suggest these measures are assessing a similar construct (Kinderman & Bentall, 1996). However, the IPSAQ internality scales have better reliability than the ASQ internality scales, and the IPSAQ has been found to discriminate individuals with low mood and paranoia in a non-clinical sample (Kinderman & Bentall, 1996).

Eating Disorders Examination Questionnaire (EDE-Q). The EDE-Q (Fairburn & Beglin, 1994) is a self-report measure of eating attitudes and behaviours focusing on the last 28 days (see Appendix II). It consists of 36 items, which constitute four sub-scales: restraint, weight concern, shape concern and eating concern. Each item is rated on a 7-point scale of severity. A global score is also calculated; the clinical cut-off for the global score is ≥ 2.3 (Mond, Hay, Rodgers, Owen & Beumont, 2004). The EDE-Q also measures the frequency of behaviours such as bingeing and vomiting.

The EDE-Q is derived from the Eating Disorders Examination (EDE; Fairburn & Cooper, 1993), which is a semi-structured interview widely used in the assessment and diagnosis of an eating disorder using DSM-IV criteria (APA, 1994). The validity of the EDE is well established (see Fairburn & Cooper, 1993). The EDE-Q was designed as a less time-consuming version of the EDE, for the purposes of research and measuring outcome.

A high level of consistency has been obtained between the EDE-Q and EDE on the four sub-scales and most of the eating-disordered behaviours, although discrepancies have been found on the reporting of binge eating (e.g., Fairburn & Beglin, 1994; Mond, et al., 2004). The EDE-Q has been found to discriminate between clinical women and non-clinical women (Mond et al., 2004) and has good internal consistency and test-retest reliability (Luce & Crowther, 1999). Compared to the Eating Disorders Inventory II (EDI-II; Garner, 1991), the EDE-Q includes separate subscales for the cognitive elements of an eating disorder and the actual eating behaviours, whereas the EDI combines these within its subscales. This distinction is important for the present study, which is looking at cognitive processes that are potentially linked to different eating-disordered cognitions.

Beck Depression Inventory II (BDI-II). The BDI-II (Beck, Steer & Brown, 1996) is a self-report measure of depressed mood focusing on the last 14 days. It consists of 21 items that aim to assess the existence and severity of the symptoms of depression using DSM-IV criteria (APA, 1994). Most items are rated on a 4-point scale although 2 items are rated on a 7-point scale; all the items constitute the total score. The different versions of the BDI have been extensively used in previous research and the BDI-II has better psychometric properties than earlier editions (see Beck, Steer, Ball & Ranieri, 1996).

Spot-the-Word Test. The Spot-the-Word Test (Baddeley, Emslie & Nimmo-Smith, 1993) is a measure of pre-morbid, verbal intelligence. It involves

presenting a list of 60 pairs of words comprising one real word and one non-word. The participant is required to mark the real word. There are two versions of the test: Form A and Form B. Participants are given six practice pairs before being presented with the 60 items. The words range in familiarity and the non-words are easily pronounceable and similar in length to the real words. The total number of correct responses are calculated using the scoring template and a scaled score is obtained from the table provided, which takes into account the participant's age.

The 2 forms of the Spot-the-Word Test (Form A and Form B) have been found to correlate highly (Baddeley et al., 1993). Performance on the Spot-the-Word test has been found to correlate with verbal intelligence as estimated by the Mill Hill Vocabulary test (Raven, 1958) and with performance on the National Adult Reading Test (NART; Nelson, 1982) (Baddeley et al., 1993). Performance on the Spot-the-Word test has not been found to decline with age (Baddeley et al., 1993).

Experimental Materials

A Stroop-type task (Stroop, 1935) was used as a measure of attentional bias, which has been used by previous studies (e.g., McManus et al., 1996; Waller et al., 1996). The task was carried out on a single Toshiba Satellite Pro A60 EN Laptop using the computer programme Superlab Pro, Version 2.0. The task involved colour-naming 128 words presented individually in the centre of a white screen. The words were presented in red, green, black and blue. All the words were presented in lower case letters using Arial font size 80. Participants responded to the words using a Cedrus

RB-420 response pad, which had coloured buttons that corresponded to the colour of the words.

There were four lists each consisting of eight words. Two of the lists consisted of 'self-esteem' words (threats to self-esteem and positive self-esteem cues) and two consisted of neutral words matched to the self-esteem words on frequency of occurrence in the English language (using the criteria of Johansson & Hofland, 1989), initial letter and (as far as possible) word length. The self-esteem and neutral words used in each condition were:

Self-esteem threat – failure, stupid, ugly, inadequate, bad, inferior, worthless, defeated;

Threat neutral – flowers, saving, urban, innumerable, bit, immortal, wavering, deciding;

Positive self-esteem – beautiful, intelligent, worthy, successful, deserving, competent, secure, honest;

Positive neutral – becomes, identified, waters, selection, dimension, calendar, sample, handed.

Each word was presented four times, once in each colour. The computer programme mixed the lists of words and randomised the order of the words and colours for each participant. Each word was presented for a maximum of 2000 milliseconds (ms). A bias towards the self-esteem words was calculated by subtracting the mean time (ms per word) taken to colour-name the neutral words from the mean time (ms per word) taken to colour-name the corresponding self-esteem words. An 'error' rate was calculated,

which refers to the number of words incorrectly responded to. A 'no response' rate was also calculated, which refers to the number of words not responded to.

The self-esteem threat and matched neutral words were the same lists validated and used by McManus et al., (1996) with the exception of 'saving,' which replaced the word 'skilled,' since this potentially reflects a positive self-esteem cue. Since McManus et al. (1996) did not include a list of positive self-esteem cues, the ones used in this study were chosen on the basis of being semantically similar to the threat words (as far as possible). The validity of this categorisation was tested using four independent raters who were not part of the experimental groups. They were presented with a randomly mixed list consisting of the positive and neutral words, and asked to categorise these as 'positive words about the self,' 'neutral words,' or 'neither of these.' All the raters agreed with the above categorisation of the words, with the exception of one rater who categorised the word 'intelligent' as 'neither.'

Procedure

Participants from the clinical group were informed of the study by their clinician following their assessment or therapy session. If they were interested in finding out more, they were introduced to the researcher. Participants from the control group were informed of the study on an opportunistic basis by the researcher. All participants were given an information sheet (see Appendix III). If they agreed to take part, they were offered the opportunity to complete the study straight away or to arrange

another appointment. All participants signed a consent form (see Appendix IV).

Participants were given standardised instructions for the Stroop task (see Appendix V) and completed a practice task of eight neutral words, which presented each colour on two occasions. The words included in the practice were: tree, found, bottle, general, book, within, chair, sometimes. Participants then completed the 'emotional' Stroop task and the four measures. Following this, they were informed that the study was over and debriefed. With the participant's consent, demographic information for the clinical group on diagnosis, age and BMI was collected from their clinical file. General Practitioners were written to informing them of the individual's participation (see Appendix VI). Participants from the non-clinical group were either asked their weight and height, or these were measured at the eating disorders service, depending on where the research was carried out.

Ethical Issues

Ethical approval for this study was obtained from Wandsworth Local Research Ethics Committee at St. Georges' Healthcare NHS Trust (see Appendix VII).

Results

The dependent variables were distributed normally. Therefore, parametric tests were used throughout the analyses. There was no difference between the clinical and control groups on age [$p > .5$]. Therefore, this variable was not controlled for in the analyses. As expected, the clinical group had a lower BMI compared to the control group [$t(49) = 2.28$; $p = .027$]. Therefore, this variable was controlled for in the analyses below.

Descriptive data

Table 1 shows the descriptive data for the estimate of premorbid intelligence (Spot the Word), eating pathology (EDE-Q) and depressed mood (BDI-II) for each group. There was no difference between the clinical and control groups on Spot the Word scores [$p > .5$]. Therefore, this variable was not controlled for in the analyses. As expected, there were differences between the clinical and control groups on all subscales and behaviours of the EDE-Q, with the clinical group scoring higher on each. The mean EDE-Q global score for the clinical group was above the clinical cut-off (≥ 2.3), whereas the mean global score for the control group was below it (see Mond et al., 2004). The control group did not report any episodes of vomiting. There was also a difference between the groups on BDI-II scores. Therefore, this variable was controlled for in the analyses below.

Table 1. Means, standard deviations and t-values for premorbid intelligence (Spot the Word), eating pathology (EDE-Q) and depressed mood (BDI-II) for each group.

	<u>Clinical Group</u>		<u>Control Group</u>		<u>t-test</u>		
	(n = 25)		(n = 26)		t	df	p
	M	(SD)	M	(SD)			
Spot the Word (Max. score = 18)	11.40	(2.40)	11.35	(2.64)	.08	49	.940
EDE-Q Restraint (Max. score = 6)	3.95	(1.39)	1.04	(1.27)	7.79	48.23*	.001
EDE-Q Eating concern (Max. score = 6)	3.66	(1.42)	.21	(.26)	11.95	25.57*	.001
EDE-Q Weight concern (Max. score = 6)	4.10	(1.58)	.66	(.52)	10.38	28.87*	.001
EDE-Q Shape concern (Max. score = 6)	4.58	(1.45)	.99	(.76)	10.96	36.04*	.001
EDE-Q Global (Max. score = 6)	4.07	(1.31)	.73	(.60)	11.64	33.28*	.001
Binge frequency	8.12	(9.78)	.35	(1.06)	3.95	24.54*	.001
Vomit frequency	11.40	(20.43)	-	-	-	-	-
BDI-II (Max. score = 63)	29.40	(13.78)	4.15	(4.73)	8.68	29.38*	.001

* Equal variances not assumed where Levene's Test was significant [p < .05]

Relationship with depressed mood

Hypothesis 1 predicted that higher levels of depressed mood would be associated with a more negative attributional style in women with an eating disorder and in non-clinical women. The correlations (Pearson's r) of depressed mood (BDI-II) with attributional style (IPSAQ) are presented in Table 2. Due to the number of correlations, a more stringent alpha level ($p < .01$) was used. In the clinical group, using a one-tailed test (in accordance with the hypothesis), there was a positive correlation of depressed mood with 'internal attribution for negative events'. There was also a negative correlation of depressed mood with externalising bias (EB) (the lower the EB score, the greater the tendency to attribute negative events to the self, relative to positive events). There were no correlations of depressed mood with attributional style for positive events. In the control group, there were no correlations of depressed mood with attributional style. Therefore, hypothesis 1 was partly supported. There was a dimensional relationship between levels of depressed mood and an internal attributional style for negative events (but not positive events) in eating-disordered women but not non-clinical women.

Due to the difference in depressed mood (BDI-II) between the clinical and control groups, the relationship of depressed mood with attentional bias towards negative and positive words, 'error' rate and 'no response' rate (Stroop scores) was also explored (see Table 2). There were no correlations of depressed mood with Stroop scores in either group.

Table 2. Correlations (Pearson's r) of depressed mood (BDI-II) with attentional bias (Stroop scores) and attributional style (IPSAQ) in the clinical and control group (using one-tailed tests).

	Clinical Group (n = 25)		Control Group (n = 26)	
	r	p	r	p
<i>IPSAQ</i>				
Internal attribution - negative events	.48	.008	.21	<u>NS</u>
Personal attribution - negative events	-.40	<u>NS</u>	-.06	<u>NS</u>
Situational attribution - negative events	-.16	<u>NS</u>	-.12	<u>NS</u>
Internal attribution - positive events	-.27	<u>NS</u>	-.18	<u>NS</u>
Personal attribution - positive events	.17	<u>NS</u>	-.24	<u>NS</u>
Situational attribution - positive events	.15	<u>NS</u>	.40	<u>NS</u>
Externalizing Bias (EB)	-.58	.001	-.28	<u>NS</u>
Personalizing Bias (PB)	-.39	<u>NS</u>	.02	<u>NS</u>
<i>Stroop scores</i>				
Bias toward negative words	-.19	<u>NS</u>	.18	<u>NS</u>
Bias toward positive words	.05	<u>NS</u>	.15	<u>NS</u>
Error rate	-.21	<u>NS</u>	-.29	<u>NS</u>
No response rate	.15	<u>NS</u>	.20	<u>NS</u>

NS = Not Significant

Group differences

Hypothesis 2 predicted that women with an eating disorder would demonstrate a greater attentional bias towards self-esteem threats and a more negative attributional style than non-clinical women. The difference in attentional bias towards positive self-esteem cues between the two groups was also explored. Differences between the two groups in the number of incorrect and absent responses were also examined. The means (ms per word) and standard deviations for attentional bias towards negative and positive words, 'error' rate and 'no response' rate (Stroop scores) for each group are presented in Table 3. The MANCOVA showed no main effect of group on any of the Stroop scores, and no covariate effect of BMI or depressed mood (BDI-II). Therefore, this part of hypothesis 2 was not supported.

Table 4 shows the means and standard deviations for attributional style (IPSAQ) for each group. Using a one-tailed test (in accordance with the hypothesis), the MANCOVA showed a main effect of group on 'internal attribution for negative events'. The MANCOVA also showed an effect of depressed mood (BDI-II) on 'internal attribution for negative events', externalising bias and personalising bias (PB) (a PB score of more than 0.5 represents a tendency to attribute negative events to others). There was no effect of BMI. Therefore, this part of hypothesis 2 was supported. Women with an eating disorder made more internal attributions for negative events than non-clinical women, irrespective of depressed mood.

Table 3. Means, standard deviations and MANCOVA for attentional bias, 'error' rate and 'no response' rate (Stroop scores) for each group.

	Sample				MANCOVA					
	Clinical		Control		Group		BMI		BDI-II	
	(n = 25)		(n = 26)							
<i>Stroop scores</i>	M	(SD)	M	(SD)	F (1, 47)	<u>p</u>	F (1, 47)	<u>p</u>	F (1, 47)	<u>p</u>
Bias toward negative words (ms per word)	-7.51	(43.66)	-6.11	(47.91)	.26	<u>NS</u>	1.09	<u>NS</u>	.22	<u>NS</u>
Bias toward positive words (ms per word)	-5.27	(44.32)	-15.98	(50.71)	.01	<u>NS</u>	.33	<u>NS</u>	.18	<u>NS</u>
Error rate (no. of words)	4.72	(5.47)	4.58	(4.74)	1.68	<u>NS</u>	.32	<u>NS</u>	2.09	<u>NS</u>
No response Rate (no. of words)	.56	(.92)	.31	(.62)	.02	<u>NS</u>	.01	<u>NS</u>	1.09	<u>NS</u>
<u>NS</u> = Not Significant										

Table 4. Means, standard deviations and MANCOVA for attributional style (IPSAQ) for each group (using one-tailed tests).

IPSAQ	Sample				MANCOVA					
	Clinical (n = 25)		Control (n = 26)		Group		BMI		BDI-II	
	M	(SD)	M	(SD)	F (1, 47)	p	F (1, 47)	p	F (1, 47)	p
Internal attribution - negative event	10.68	(3.21)	5.23	(2.79)	3.66	.031	.57	<u>NS</u>	7.89	.007
Personal attribution - negative event	3.56	(2.95)	6.23	(3.17)	.20	<u>NS</u>	.01	<u>NS</u>	3.69	<u>NS</u>
Situational attribution - negative event	1.72	(2.28)	4.50	(3.25)	2.01	<u>NS</u>	.37	<u>NS</u>	.60	<u>NS</u>
Internal attribution - positive event	7.52	(2.96)	8.96	(2.44)	.01	<u>NS</u>	.21	<u>NS</u>	2.79	<u>NS</u>
Personal attribution - positive event	5.20	(2.97)	3.58	(1.84)	.56	<u>NS</u>	1.50	<u>NS</u>	.35	<u>NS</u>
Situational attribution - positive event	3.16	(2.59)	3.12	(2.82)	.62	<u>NS</u>	2.12	<u>NS</u>	2.08	<u>NS</u>
Externalizing Bias (EB)	-3.16	(4.00)	3.73	(3.66)	2.37	<u>NS</u>	.07	<u>NS</u>	12.83	.001
Personalizing Bias (PB)	0.58	(0.40)	0.59	(0.26)	2.76	<u>NS</u>	.01	<u>NS</u>	4.80	.033

NS = Not Significant

Eating pathology

Hypothesis 3 predicted that higher levels of eating pathology would be associated with a greater attentional bias towards self-esteem threats and with a more negative attributional style, in both women with an eating disorder and non-clinical women. The relationship between eating pathology and attentional bias towards positive self-esteem cues was also explored. Due to the difference in BMI and depressed mood (BDI-II) between the clinical and control groups, partial correlations (r) were carried out to examine the relationship of eating pathology (EDE-Q) with attentional bias (Stroop scores) and attributional style (IPSAQ). One-tailed tests were used for correlations between attributional style and eating pathology, in accordance with the hypothesis. No correlations were found between strength of eating pathology and levels of attentional bias or attributional style in eating disordered women or non-clinical women (see Tables 5, 6, 7 and 8). Therefore, hypothesis 3 was not supported.

Table 5. Partial correlations (*r*) for attentional bias (Stroop scores) and eating pathology (EDE-Q), controlling for BMI and depressed mood (BDI-II), for the clinical group.

	<i>Eating pathology (EDE-Q)</i>											
	Restraint		Eating concern		Weight concern		Shape concern		Binge frequency		Vomit frequency	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
<i>Stroop scores</i>												
Bias toward negative words	.06	<u>NS</u>	.05	<u>NS</u>	-.12	<u>NS</u>	-.05	<u>NS</u>	-.18	<u>NS</u>	-.31	<u>NS</u>
Bias toward positive words	.21	<u>NS</u>	.11	<u>NS</u>	.31	<u>NS</u>	.26	<u>NS</u>	.26	<u>NS</u>	-.22	<u>NS</u>
Error rate	-.02	<u>NS</u>	-.24	<u>NS</u>	-.09	<u>NS</u>	-.05	<u>NS</u>	-.02	<u>NS</u>	-.08	<u>NS</u>
No response rate	-.03	<u>NS</u>	-.15	<u>NS</u>	-.16	<u>NS</u>	-.19	<u>NS</u>	-.02	<u>NS</u>	.07	<u>NS</u>

NS = Not Significant

Table 6. Partial correlations (r) for attentional bias (Stroop scores) and eating pathology (EDE-Q), controlling for BMI and depressed mood (BDI-II), for the control group.

	<i>Eating pathology (EDE-Q)</i>									
	Restraint		Eating concern		Weight concern		Shape concern		Binge frequency	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
<i>Stroop scores</i>										
Bias toward negative words	-.31	<u>NS</u>	-.03	<u>NS</u>	.19	<u>NS</u>	.13	<u>NS</u>	-.34	<u>NS</u>
Bias toward positive words	-.10	<u>NS</u>	.12	<u>NS</u>	.08	<u>NS</u>	.20	<u>NS</u>	-.12	<u>NS</u>
Error rate	.25	<u>NS</u>	.16	<u>NS</u>	.26	<u>NS</u>	.09	<u>NS</u>	-.15	<u>NS</u>
No response rate	-.17	<u>NS</u>	-.14	<u>NS</u>	.28	<u>NS</u>	.12	<u>NS</u>	-.27	<u>NS</u>

NS = Not Significant

Table 7. Partial correlations (*r*) for attributional style (IPSAQ) and eating pathology (EDE-Q), controlling for BMI and depressed mood (BDI-II), for the clinical group (using one-tailed tests).

	<i>Eating pathology (EDE-Q)</i>											
	Restraint		Eating concern		Weight concern		Shape concern		Binge frequency		Vomit frequency	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
<i>IPSAQ</i>												
Internal attribution – negative event	.18	<u>NS</u>	.13	<u>NS</u>	-.03	<u>NS</u>	.27	<u>NS</u>	.11	<u>NS</u>	.10	<u>NS</u>
Personal attribution - negative event	-.04	<u>NS</u>	-.27	<u>NS</u>	-.22	<u>NS</u>	-.41	<u>NS</u>	-.14	<u>NS</u>	-.18	<u>NS</u>
Situational attribution - negative event	-.17	<u>NS</u>	.18	<u>NS</u>	.31	<u>NS</u>	.16	<u>NS</u>	.03	<u>NS</u>	.08	<u>NS</u>
Internal attribution - positive event	.37	<u>NS</u>	.29	<u>NS</u>	.12	<u>NS</u>	.17	<u>NS</u>	.42	<u>NS</u>	.24	<u>NS</u>
Personal attribution - positive event	-.34	<u>NS</u>	-.18	<u>NS</u>	-.32	<u>NS</u>	-.34	<u>NS</u>	-.35	<u>NS</u>	-.28	<u>NS</u>
Situational Attribution - positive event	.01	<u>NS</u>	-.25	<u>NS</u>	.18	<u>NS</u>	.10	<u>NS</u>	-.17	<u>NS</u>	-.01	<u>NS</u>
Externalizing Bias (EB)	.17	<u>NS</u>	.14	<u>NS</u>	.13	<u>NS</u>	-.09	<u>NS</u>	.28	<u>NS</u>	.13	<u>NS</u>
Personalizing Bias (PB)	.02	<u>NS</u>	-.23	<u>NS</u>	-.41	<u>NS</u>	-.34	<u>NS</u>	-.14	<u>NS</u>	-.02	<u>NS</u>

NS = Not Significant

Table 8. Partial correlations (r) for attributional style (IPSAQ) and eating pathology (EDE-Q), controlling for BMI and depressed mood (BDI-II), for the control group (using one-tailed tests).

	<i>Eating pathology (EDE-Q)</i>									
	Restraint		Eating concern		Weight concern		Shape concern		Binge frequency	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
<i>IPSAQ</i>										
Internal attribution – negative event	.01	<u>NS</u>	-.11	<u>NS</u>	.07	<u>NS</u>	.07	<u>NS</u>	-.12	<u>NS</u>
Personal attribution - negative event	.21	<u>NS</u>	.12	<u>NS</u>	.04	<u>NS</u>	-.15	<u>NS</u>	.35	<u>NS</u>
Situational attribution - negative event	-.20	<u>NS</u>	-.01	<u>NS</u>	-.08	<u>NS</u>	.10	<u>NS</u>	-.22	<u>NS</u>
Internal attribution - positive event	-.13	<u>NS</u>	-.09	<u>NS</u>	-.10	<u>NS</u>	-.23	<u>NS</u>	-.28	<u>NS</u>
Personal attribution - positive event	.10	<u>NS</u>	-.26	<u>NS</u>	-.34	<u>NS</u>	-.34	<u>NS</u>	.35	<u>NS</u>
Situational Attribution - positive event	-.06	<u>NS</u>	-.02	<u>NS</u>	.02	<u>NS</u>	.11	<u>NS</u>	.06	<u>NS</u>
Externalizing Bias (EB)	-.09	<u>NS</u>	.02	<u>NS</u>	-.12	<u>NS</u>	-.21	<u>NS</u>	-.10	<u>NS</u>
Personalizing Bias (PB)	.20	<u>NS</u>	.02	<u>NS</u>	.15	<u>NS</u>	-.03	<u>NS</u>	.20	<u>NS</u>

NS = Not Significant

Attentional bias and attributional style

Hypothesis 4 predicted that a negative attributional style would be associated with a greater attentional bias towards self-esteem threat, both in women with an eating disorder and non-clinical women. The relationship between attentional bias towards positive self-esteem cues and attributional style was also explored. Partial correlations (r) were carried out to examine the relationship between attentional bias (Stroop scores) and attributional style (IPSAQ). The partial correlations between attentional bias and attributional style for the clinical group are presented in Table 9, and the partial correlations between attentional bias and attributional style for the control group are presented in Table 10. There were no correlations in either group between attentional bias and attributional style. Therefore, hypothesis 4 is not supported for eating-disordered or non-clinical women.

Table 9. Partial correlations (r) for attentional bias (Stroop scores) and attributional style (IPSAQ), controlling for BMI and depressed mood (BDI-II), for the clinical group.

<i>IPSAQ</i>	<i>Stroop scores</i>			
	Bias toward negative words		Bias toward positive words	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Internal attribution - negative events	.10	<u>NS</u>	.01	<u>NS</u>
Personal attribution - negative event	.09	<u>NS</u>	.02	<u>NS</u>
Situational attribution - negative event	-.21	<u>NS</u>	-.07	<u>NS</u>
Internal attribution - positive event	.20	<u>NS</u>	.32	<u>NS</u>
Personal attribution - positive event	-.10	<u>NS</u>	-.33	<u>NS</u>
Situational attribution - positive event	-.06	<u>NS</u>	.05	<u>NS</u>
Externalizing Bias (EB)	.10	<u>NS</u>	.27	<u>NS</u>
Personalizing Bias (PB)	.02	<u>NS</u>	-.09	<u>NS</u>

NS = Not Significant

Table 10. Partial correlations (r) for attentional bias (Stroop scores) and attributional style (IPSAQ), controlling for BMI and depressed mood (BDI-II), for the control group.

<i>IPSAQ</i>	<i>Stroop scores</i>			
	Bias toward negative words		Bias toward positive words	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Internal attribution - negative events	-.12	<u>NS</u>	.12	<u>NS</u>
Personal attribution - negative event	-.09	<u>NS</u>	-.16	<u>NS</u>
Situational attribution - negative event	.19	<u>NS</u>	.07	<u>NS</u>
Internal attribution - positive event	-.15	<u>NS</u>	.02	<u>NS</u>
Personal attribution - positive event	-.40	<u>NS</u>	-.31	<u>NS</u>
Situational attribution - positive event	.04	<u>NS</u>	-.13	<u>NS</u>
Externalizing Bias (EB)	-.01	<u>NS</u>	-.08	<u>NS</u>
Personalizing Bias (PB)	-.12	<u>NS</u>	-.15	<u>NS</u>
<u>NS</u> = Not Significant				

Discussion

This study aimed to determine levels of attentional bias to threat and attributional style in the eating disorders, and the impact of depressed mood and severity of eating pathology. It also aimed to determine the relationship between attentional bias to threat and attributional style. The current study employed a Stroop-type task (Stroop, 1935) as a measure of attentional bias. The IPSAQ (Kinderman & Bentall, 1996) was used as a measure of internal-external attributional style.

Summary of Findings

This study found a dimensional relationship between levels of depressed mood and an internal attributional style for negative events in eating-disordered women. Depressed mood was also associated with a low externalising bias (i.e., a tendency to attribute more negative events to the self than positive events) in this group of women. As predicted, women with an eating disorder had a greater tendency to attribute negative situations to the self, compared to non-clinical women. This tendency was found despite the impact of depressed mood. However, differences between the two groups of women in the degree of externalising bias and personalising bias disappeared when the impact of depressed mood was controlled for. There were no differences between the groups in their attributional style for positive situations.

The results of this study did not show a difference between eating-disordered and non-clinical women in levels of attentional bias towards threat. Furthermore, there was not a dimensional association between

severity of eating pathology and attentional bias or attributional style. In addition, the results did not show any dimensional associations between attributional style and attentional bias in either eating-disordered women or non-clinical women.

Relationship to the Empirical Literature

The findings of this study can be discussed in relation to two strands of previous research in the eating disorders – studies examining attentional bias and studies examining attributional style.

With regards to attentional bias, this study did not replicate the findings of McManus et al. (1996), despite using the same threat cues. This could be due to two methodological differences between the studies. First, the current study randomly mixed the different lists of words, whereas McManus et al. presented each list separately (block presentation). Therefore, the apparent bias towards threat found by McManus et al. may not actually reflect the attentional processing of threatening cues (as assumed), but may represent increased levels of arousal caused by exposure to a mass of threatening stimuli (see Lee & Shafran, 2004).

The second methodological difference is in the characteristics of the clinical groups. While McManus et al. employed a bulimic sample, the current study included a 'transdiagnostic' clinical group of bulimic and restrictive individuals, in keeping with recent developments (e.g., Fairburn et al., 2003). However, research in the eating disorders has started to identify differences in threat processing between individuals with bulimic and restrictive pathology (e.g., Heath, 2004). It is therefore possible that only individuals

with bulimic pathology demonstrate the attentional bias to self-esteem threat. Furthermore, the lack of relationship between strength of eating pathology and attentional bias suggests that the severity of eating pathology is less important than the type of pathology (i.e., bulimic or restrictive).

With regards to attributional style, this study replicates previous findings (e.g., Dalglish et al., 2001; Foster et al., 2005; Mansfield & Wade, 2000) that women with an eating disorder are more likely to attribute negative events to the self, compared to non-clinical women. It also replicates previous findings regarding a lack of association between attributional style and severity of eating pathology (Foster et al., 2005). In addition, the current study extends Foster et al.'s findings by examining the impact of depressed mood. Whilst differences between groups in the degree of externalising bias and personalising bias were attributable to differences in depression, eating-disordered women still had a greater tendency to make an internal attribution for negative situations despite levels of depressed mood.

This study has failed to replicate earlier findings (e.g., Foster et al., 2005) regarding differences between eating-disordered and non-clinical women in their tendency to make external attributions for positive events. Indeed, in the eating disorders it has been suggested that beliefs about the self are more important than beliefs about other people (Cooper, Wells & Todd, 2004). However, the current study employed a smaller sample size than Foster et al. and therefore may have not had enough statistical power to replicate differences in attributional style for positive events.

Relationship to the Theoretical Literature

The findings of this study can be considered in terms of two cognitive models - the schema model of eating disorders (e.g., Waller, 2005; Waller et al., 2004) and the stages of threat processing model (Beck & Clark, 1997).

The schema model of eating disorders hypothesises that cognitive processes are driven by and maintain core beliefs (e.g., Waller, 2005). Therefore, this study hypothesised that such processes would be related. However, there is currently a lack of research examining the links between cognitive processes and core belief content in the eating disorders. Therefore, this aspect of the model needs to be empirically tested before further hypotheses can be developed regarding the relationship between different processing biases.

With regards to the stages of threat processing, the third stage of the Beck and Clark (1997) model, which involves the strategic evaluation of the threatening stimulus, is most relevant to the findings of the current study. The internal attributional style for negative events identified in eating-disordered women indicates that threat is evaluated at this stage in a different way to non-clinical women. Therefore, this strategic stage of processing is potentially important in the maintenance of an eating disorder.

Clinical Implications

The most important finding of the current study was that women with an eating disorder tend to blame the self when interpreting negative events and outcomes. This self-blaming style is likely to contribute to the maintenance of an eating disorder, through worsening self-esteem (see

Fairburn, 1997; Kelley & Michela, 1980). Therefore, therapy for the eating disorders should include an element that focuses on highlighting and re-evaluating such interpretations, using previously established cognitive techniques (e.g., Beck, 1995). The clinician should also be aware that such self-blame may impact on the therapeutic process, as patients are more likely to blame the self for obstacles encountered (Foster et al., 2005). Furthermore, given the finding that depressed mood impacts on the extent to which eating-disordered women employ the externalising bias, therapy should also encourage individuals with low mood to accept personal responsibility for positive outcomes.

Implications for Future Research

In general, further research is needed to test out and modify the predictions of the schema model of eating disorders (e.g., Waller, 2005). For example, future research might examine the links between threat processing and core belief content. Specifically, establishing the links between attributional style and core belief content would help clarify the potentially maintaining role of attributional biases in the eating disorders.

Future research into attributional style could extend the current study by examining the specificity and stability of attributions made. One potential shortcoming of the IPSAQ is that it measures only the internal-external attributional dimension (Foster et al., 2005). However, other dimensions (such as stable-unstable and global-specific) are also important, given that previous research has found the tendency to make stable and global attributions for negative events is associated with depressive symptomology

(e.g., Abramson et al., 1978) and eating pathology (e.g., Dalglish et al., 2001). In addition, future research might control for lower levels of self-esteem, as this is potentially related to a negative attributional style (Foster et al., 2005; Kelley & Michela, 1980) and is common in the eating disorders (e.g., Fairburn, 1997).

Future research examining attentional bias in the eating disorders should employ a block presentation of threat cues, as a mixed list might not be assigned enough information-processing priority to elicit attentional biases. However, the potential impact of increased levels of arousal in response to a block presentation should be considered, and information-processing models might need modification to incorporate the role of emotion on attentional bias. It has also been suggested that the attentional bias observed on the emotional Stroop actually reflects a motivation towards cognitive avoidance (e.g., Rieger et al., 1998; de Ruiter & Brosschot, 1994). Cognitive avoidance occurs when an individual avoids attending to threatening stimuli, but it has been suggested that this avoidance requires an initial orientation towards the stimuli (e.g., de Ruiter & Brosschot, 1994). Therefore, the dot probe task (MacLeod et al., 1986) might be a more appropriate measure of attentional bias, as it distinguishes between attention towards and attention away from threat (Rieger et al., 1998).

In light of recent literature suggesting that individuals with bulimic or restrictive pathology process threat differently (e.g., Waller 2005; Waller et al., 2004), future research into threat processing might include separate restrictive and bulimic clinical groups. Furthermore, given the high levels of co-morbidity with anxiety (e.g., Godart, Flament, Perdereau, & Jeammet,

2002) and depression (e.g., Fornari et al., 1992), it would be useful for future research to distinguish eating-disordered women with co-morbid anxiety or depression from women without such co-morbidity. This distinction would help establish similarities and differences in the nature of threat processing in these different groups, and would provide more information about the impact of anxiety and depression on cognitive biases in the eating disorders. The potential differences in processing biases would have implications for determining which biases to prioritise addressing in therapy for each individual.

Conclusions

The most important finding of the current study is that women with an eating disorder tend to blame the self when interpreting negative situations. This internal attributional style was present despite levels of depressed mood, and should therefore be a target of therapy. In the eating disorders, there is much scope to extend research into attributional style and other cognitive biases, and to determine the exact role of these biases on the maintenance of eating pathology.

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Part 3: Critical Appraisal

Critical Appraisal

1 Overview

The following critical appraisal aims to provide a personal reflection on the research. I will start by discussing the most clinically relevant finding in relation to the literature. I will then discuss measurement issues and how my presence might have influenced participant's responses. Finally, I will talk about the representativeness of the sample and difficulties in recruiting participants. My ideas for future research will be integrated throughout the appraisal.

2 Relationship to the Literature

This study set out to examine attentional bias to threat and attributional style in the eating disorders. None of the hypotheses surrounding attentional bias were supported. In contrast, two hypotheses regarding attributional style were partially supported. There was evidence of a dimensional relationship between depressed mood and an internal attributional style for negative events in eating-disordered women. Depressed mood was also associated with a low externalising bias in this group. In addition, women with an eating disorder had a greater tendency to attribute negative events to the self, compared to non-clinical women, and despite the impact of depressed mood.

In the following discussion of the findings, I am going to specifically focus on this self-blaming attributional style identified in eating-disordered women, as this is the most clinically relevant finding. A general examination

of the findings of this study occurs under the 'Discussion' section of the Empirical Paper.

The self-blaming style identified in this study replicates previous findings (e.g., Dalglish et al., 2001; Foster, Lawson & Waller, 2005; Mansfield & Wade, 2000) that women with an eating disorder are more likely to attribute negative events to the self, compared to non-clinical women. Furthermore, this study extends previous research by identifying this self-blaming style in eating-disordered women despite levels of depressed mood.

This finding suggests that eating-disordered women evaluate negative situations in a different way to non-clinical women. Therefore, this self-blaming style plays a potentially important role in the maintenance of an eating disorder, although the exact nature of this role remains unclear. One explanation is that this self-blaming style might worsen self-esteem (e.g., Foster et al., 2005; Kelley & Michela, 1980), which has been identified as a common characteristic in the eating disorders (e.g., Fairburn, 1997; Fairburn, Cooper & Shafran, 2003). Fairburn and colleagues suggest that as these individuals feel inadequate in many areas of their life, they evaluate themselves solely in terms of their weight and shape. This can result in extreme dieting and other eating-disordered behaviours (e.g., bingeing and purging). Therefore, cognitive processes that contribute to low self-esteem, such as attributional style, might serve to maintain the eating disorder.

Another mechanism by which this self-blaming style might contribute to the maintenance of an eating disorder is through the individual's core beliefs. The schema model of eating disorders predicts that cognitive processes are driven by and maintain core belief content (e.g., Waller, 2005).

The individual then uses different eating-disordered behaviours to cope with these beliefs. Core beliefs that have been identified in the eating disorders include perceptions of the self as being flawed, unsuccessful and socially different to others (Waller, Dickson & Ohanian, 2002; Waller, Ohanian, Meyer & Osman, 2000). Therefore, this self-blaming attributional style might be driven by these beliefs, and in turn provide evidence for their accuracy. This attributional process is similar to the 'schema surrender' coping style identified by Young, Klosko and Weishaar (2003), which involves seeking information and behaving in ways that confirm the core belief.

Both these possible explanations regarding the role of attributional style on eating pathology require further exploration. However, the different explanations are not necessarily separate, as low self-esteem and core belief content are likely to be related. Indeed, from reading the literature on cognitive conceptualisations of the eating disorders, it becomes apparent that more recent models aim to extend rather than replace previous models. Further research is needed to strengthen the theoretical basis of these recent models, for example by investigating the links between cognitive processes and core belief content. Despite this, these recent models do highlight the need for both research and therapy in the eating disorders to focus beyond concerns about food and weight. Indeed, the findings of this study suggest that therapy for the eating disorders should include an element that focuses on highlighting and re-evaluating interpretations of negative events.

3 Measurement Issues

3.1 Attentional bias

To measure attentional bias, I chose a Stroop-type task (Stroop, 1935), as this has been widely used in previous research into anxiety disorders (see Williams, Mathews & MacLeod, 1996) and the eating disorders (e.g., McManus, Waller & Chadwick, 1996; Waller, Watkins, Shuck & McManus, 1996). When designing the emotional Stroop, I tried to take into account a number of methodological problems that had been identified in previous studies. For example, I used a computerised task, which allowed reaction times to be measured more accurately than a stopwatch (Lee & Shafran, 2004), and is considered more reliable than measurement using voice activation (e.g., Davidson & Wright, 2002). Using a computer also allowed me to randomly present the different words, whereas a block presentation has been criticised for potentially increasing levels of arousal, which might influence information processing (Lee & Shafran, 2004). Furthermore, I attempted to match groups on age (e.g., Seddon & Waller, 2000) and on an estimate of premorbid intelligence, as these might have affected Stroop performance.

Whilst there is a large amount of literature examining the Stroop task and attentional bias, there seems to be a lack of agreement about what cognitive process is actually being measured (see Lee & Shafran, 2004). It has generally been assumed that if an individual takes longer to colour-name the emotional words compared to the matched neutral words, this represents an attentional bias towards the emotional stimuli (i.e., an inability to 'switch off' from the meaning of salient words) (Mathews & MacLeod, 1994). It has

been hypothesised that this attentional bias is driven by the activation of underlying schemas (e.g., Wells & Matthews, 1994). In contrast to this explanation, it has been suggested that the attentional bias observed actually reflects a motivation towards cognitive avoidance rather than an attentional bias per se (e.g., Rieger, Schotte, Touyz, Beumont & Griffiths, 1998; de Ruiter & Brosschot; 1994). Cognitive avoidance occurs when an individual avoids attending to threatening stimuli, and it has been suggested that this avoidance involves initial attention towards the stimuli (e.g., de Ruiter & Brosschot, 1994).

The process being observed (i.e., attentional bias or cognitive avoidance) might also depend in part on temporal factors, such as the length of time given to process information (Meyer, Waller & Watson, 2000). The bias on the Stroop task has been found more apparent under faster time pressure (Sharma & McKenna, 2001), whereas cognitive avoidance has been described as involving slower, more strategic processing (Ainsworth, Waller & Kennedy, 2002). However, I have found that studies vary in the length of time stimuli is presented and cognitive avoidance has been found to occur under faster time pressure (e.g., Heath, 2004), so the distinction between the two processes in terms of temporal factors appears somewhat unclear.

Compared to the Stroop task, the dot probe task (MacLeod, Mathews & Tata, 1986) has been described as a more rigorous measure of attentional bias, since it differentiates between attention towards and attention away from the threat stimuli (Rieger et al., 1998). This task involves the simultaneous presentation of two words in different areas of a screen. The

words then disappear, and a dot is presented in the spatial location of either word. Participants are required to press a button when the dot is detected. An attentional bias is assumed if there is a quicker response when the dot replaces a mood-relevant word, as attention is focused on this location. Cognitive avoidance is assumed if there is a slower response, as attention is focused away from this location towards the other word. The current study could therefore be improved by using the dot probe task to explicitly distinguish attention toward and away from threat.

To summarise, studies employing the emotional Stroop task to measure attentional bias seem to differ on the exact design of the task (which is sometimes unclear) and on the assumptions made about the process being measured. Therefore, conclusions about the findings of these studies (including the current study) need to be made with caution. Perhaps future research should employ the more sophisticated dot probe task and provide more detail about the design of the task to aid replication.

3.2 Attributional style

I chose to use the Internal, Personal and Situational Attributions Questionnaire (IPSAQ; Kinderman & Bentall, 1996) as a measure of internal-external attributional style, as it is the most psychometrically sound measure available (Kinderman & Bentall, 1996) and has been used in a recent study in the eating disorders (e.g., Foster et al., 2005). It also distinguishes between situational and personal attributions on the externality dimension.

Despite its strengths, I thought the IPSAQ was not very straightforward for participants to complete. It is a fairly long measure and

some participants stated that they found it difficult to imagine situations they had not been in. Another potential shortcoming of the IPSAQ is that it does not measure attributional dimensions such as stable-unstable and global-specific (Foster et al., 2005). These dimensions are important, given that previous research has found the tendency to make stable and global attributions for bad events is associated with depressive symptomology (e.g., Abramson, Metalsky & Alloy, 1989) and eating pathology (e.g., Dalglish et al., 2001). Day and Maltby (2000) have developed a questionnaire that incorporates internal, personal and situational attributions (based on the IPSAQ; Kinderman & Bentall, 1996), together with indices of stability and specificity (based on the ASQ; Peterson et al., 1982). However, its validity is yet to be established with clinical populations and the researchers acknowledge that the questionnaire retains similar problems to the original ASQ regarding the low internal reliability of subscales.

It would be interesting to examine the qualitative responses on the IPSAQ, as this might provide interesting information regarding the nature of the attributions made. For example, Cooper (1997) found that women with an eating disorder interpreted ambiguous negative situations with a judgment about the self, relating to weight and shape. These interpretations may have been related to the individual's disorder-specific cognitions. It would be interesting for future research to examine whether other explanations given on the IPSAQ, not relating to weight and shape, are linked to the individual's general core beliefs.

3.3 My influence

I am aware that my presence while participants were completing the questionnaires might have influenced them to respond in a socially acceptable way. This is a well-known response bias, commonly referred to as 'social desirability' (Barker, Pistrang & Elliott, 2002). In the current study, this is likely to be a particular problem on the Eating Disorders Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 1994). Participants in the control group, who either worked in the eating disorders service or knew me personally, may have been motivated to portray a positive impression i.e., that they do not have eating difficulties. In contrast, participants in the clinical group might have been more motivated to portray an impression that they had an eating difficulty and were deserving of help.

4 Representativeness of the Sample

It is interesting to consider the extent to which the sample employed in this study is representative of the general population. With regards to the clinical group, since over half the participants met DSM-IV criteria for an Eating Disorder Not Otherwise Specified (EDNOS; American Psychiatric Association, 1994), this represents the clinical group most commonly seen in clinical settings (Fairburn & Harrison, 2003). However, the majority of previous research has excluded this diagnostic group (Lee & Shafran, 2004). I am aware that the sample included in this study is not representative of all women with an eating disorder, as it focused solely on outpatients at a specialist service, and does not include inpatients or individuals in secondary care (Foster et al., 2005; Waller, 1996).

It would be interesting to examine the characteristics of those who chose to participate in the study compared to those who did not, given that over one third of patients approached declined to take part. Based on research looking at engagement in therapy (e.g., Waller, 1996), characteristics such as severity of eating pathology, levels of dissociative symptomatology and borderline characteristics such as impulsivity, affective dysregulation and inability to form relationships could be explored. Participation may also be linked to the core belief that one must submit to the wishes of other people (i.e., subjugation), which is common in the eating disorders (Waller et al., 2002). It is interesting to note that the women who did participate often commented that they had carried out research at university or that they thought research was important, suggesting the role of personal experience and interest.

Although I measured levels of depressed mood in this study, which is a common co-occurrence in the eating disorders (e.g., Fornari et al., 1992), I did not differentiate individuals who met diagnostic criteria for depression. It has also been pointed out that the Beck Depression Inventory-II (BDI; Beck, Steer & Brown, 1996) measures general emotional distress rather than the specific diagnostic criteria for depression (Metalsky et al., 1997). Therefore, this study could be improved by including a depressed comparison group or by distinguishing participants who met diagnostic criteria for co-morbid depression. This distinction would help establish similarities and differences in attributional style of these different groups, and would provide more information about the impact of depression on cognitive processes in the eating disorders. The potential differences in information processing would

have implications for determining which biases to prioritise addressing in therapy for each individual. In addition, this study did not measure levels of anxiety, which is also a common co-occurrence in the eating disorders (e.g., Godart et al., 2003) and has been found to have an impact on attentional bias in the eating disorders (Heath, 2004).

With regards to the non-clinical group, all the women approached to take part agreed. This might be due to their professional or personal contact with myself. However, this group is likely to be biased in that the majority had been through higher education and were 'white collar' professionals. Furthermore, many worked in mental health settings. Therefore, it cannot be assumed that the non-clinical sample is representative of the 'normal' population.

5 Difficulties in Recruitment

Recruiting participants for the clinical group proved particularly difficult for a number of reasons. First, the main assessor at the service informed me that more patients were declining to talk to me about the research, compared to previous research that had been carried out at the same service. Furthermore, over one third of patients who agreed to find out more about the research chose not to participate. Time might have been a factor in this, as patients were also being asked to participate in another study. Second, only certain members of staff informed their patients about the research. Interestingly, these were members of staff who carried out research as part of their role within the service. Other staff members might not have asked their patients for a number of reasons, such as it not being part of their usual

routine, it understandably not being given priority and staff not fully understanding what they were being asked to do. These possible reasons have been discussed elsewhere in terms of barriers to introducing something new into routine practice (e.g., Tarrier, Barrowclough, Haddock & McGovern, 1999).

In hindsight, these problems with recruitment could have been overcome in a number of ways. I could have gained ethical approval to carry out the study with the inpatient service, in addition to the outpatient service. I could also have worked harder to remind staff on a more regular basis about asking their patients and could have mentioned the research more regularly, for example at the team meetings. Furthermore, the option of participating in one study rather than two could have been made more explicit to patients.

6 Summary

The most clinically relevant finding of the current study is the internal attributional style for negative events identified in eating-disordered women. This self-blaming style should therefore be a target of therapy, although its exact role on the maintenance of eating pathology requires further exploration. The main practical difficulty I encountered in the current study was in recruiting participants for the clinical group. From a theoretical position, I found it difficult to interpret the findings of the Stroop task, due to the methodological and theoretical inconsistencies of previous studies.

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Appendices

- I Internal, Personal and Situational Attributions Questionnaire
- II Eating Disorders Examination Questionnaire
- III Information Sheets
- IV Consent Forms
- V Standardised Instructions for the Stroop Task
- VI Letter to GPs
- VII Letter of Ethical Approval

Appendix I

Internal, Personal and Situational Attributions Questionnaire (IPSAQ)

IPSAQ

INSTRUCTIONS:

Please read the statements below. For each statement please try to vividly imagine that event happening to you. Then try to decide what was the main cause of the event described in each statement. Please write the cause you have thought of in the space provided. Then tick the appropriate letter (a,b or c) according to whether the cause is:

- a) Something about you
- b) Something about another person (or a group of people)
- c) Something about the situation (circumstances or chance)

It might be quite difficult to decide which of these options is exactly right. In this case, please pick **one option**, the option which **best** represents your opinion. Please pick **only one** letter in each case.

1. A friend gave you a lift home.

What caused your friend to give you a lift home? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

2. A friend talked about you behind your back.

What caused your friend to talk about you behind your back? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

3. A friend said that he/she has no respect for you.

What caused your friend to say that he/she has no respect for you ? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

4. A friend helped you with the gardening.

What caused your friend to help you with the gardening? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

5. A friend thinks you are trustworthy.

What caused your friend to think you are trustworthy? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

6. A friend refused to talk to you.

What caused your friend to refuse to talk to you? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

7. A friend thinks you are interesting.

What caused your friend to think you are interesting? *(Please write down the one major cause)*

.....
Is this : a. _____ Something about you ?
(tick one) b. _____ Something about the other person or other people ?
 c. _____ Something about the situation (circumstances or chance) ?

8. **A friend sent you a postcard.**

What caused your friend to send you a postcard? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

9. **A friend thinks you are unfriendly.**

What caused your friend to think that you are unfriendly? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

10. **A friend made an insulting remark to you.**

What caused your friend to insult you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

11. **A friend bought you a present.**

What caused your friend to buy you a present? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

12. **A friend picked a fight with you.**

What caused your friend to fight with you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

13. **A friend thinks you are dishonest.**

What caused your friend to think you are dishonest? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

14. **A friend spent some time talking to you.**

What caused your friend to spend time talking with you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

15. **A friend thinks you are clever.**

What caused your friend to think you are clever? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

16. **A friend refused to help you with a job.**

What caused your friend to refuse to help you with the job? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

17. **A friend thinks you are sensible.**
What caused your friend to think that you were sensible? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

18. **A friend thinks you are unfair.**
What caused your friend to think that you are unfair? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

19. **A friend said that he/she dislikes you.**
What caused your friend to say that he/she dislikes you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

20. **A friend rang to enquire about you.**
What caused your friend to ring to enquire about you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

21. **A friend ignored you**
What caused your friend to ignore you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

22. **A friend said that she/he admires you.**
What caused your friend to say that she/he admired you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

23. **A friend said that he/she finds you boring.**
What caused your friend to say that he/she finds you boring? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

24. **A friend said that she/he resents you.**
What caused your friend to say that she/he resents you? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

25. **A friend visited you for a friendly chat.**
What caused your friend to visit you for a chat? *(Please write down the one major cause)*

.....
Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
c. ☐ Something about the situation (circumstances or chance) ?

26. **A friend believes that you are honest.**
What caused your friend to believe that you are honest? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
27. **A friend betrayed the trust you had in her.**
What caused your friend to betray your trust? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
28. **A friend ordered you to leave.**
What caused your friend to order you to leave? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
29. **A friend said that she/he respects you.**
What caused your friend to say that she/he respects you? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
30. **A friend thinks you are stupid.**
What caused your friend to think that you are stupid? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
31. **A friend said that he/she liked you.**
What caused your friend to say that he/she liked you? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?
32. **A neighbour invited you in for a drink.**
What caused your friend to invite you in for a drink? *(Please write down the one major cause)*
-
- Is this : a. ☐ Something about you ?
(tick one) b. ☐ Something about the other person or other people ?
 c. ☐ Something about the situation (circumstances or chance) ?

Appendix II

Eating Disorders Examination Questionnaire (EDE-Q)

EDE-Q

Instructions

The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the appropriate number on the right. Please answer all the questions.

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS		No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1.	Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2.	Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3.	Have you <u>tried</u> to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4.	Have you <u>tried</u> to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
5.	Have you wanted your stomach to be empty?	0	1	2	3	4	5	6
6.	Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7.	Have you been afraid of losing control over eating?	0	1	2	3	4	5	6
8.	Have you had episodes of binge eating?	0	1	2	3	4	5	6
9.	Have you eaten in secret? (Do not count binges.)	0	1	2	3	4	5	6
10.	Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
11.	Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example read, watch TV or follow a conversation?	0	1	2	3	4	5	6
12.	Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13.	Have you felt fat?	0	1	2	3	4	5	6
14.	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

OVER THE PAST FOUR WEEKS (28 DAYS)

15.	On what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges.) (Circle the number which applies.)	0 – None of the times 1 – A few of the times 2 – Less than half the times 3 – Half the times 4 – More than half the times 5 – Most of the times 6 – Every time
-----	--	--

16.	Over the past four weeks (28 days), have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please circle YES or NO and put appropriate number in box.)	YES	NO
17.	How many such episodes have you had over the past four weeks?	()
18.	During how many of these episodes of overeating did you have a sense of having lost control over your eating?	()
19.	Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have <u>not</u> eaten an unusually large amount of food given the circumstances?	YES	NO
20.	How many such episodes have you had over the past four weeks?	()
21.	Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight?	YES	NO
22.	How many times have you done this over the past four weeks?	()
23.	Have you taken laxatives as a means of controlling your shape or weight?	YES	NO
24.	How many times have you done this over the past four weeks?	()
25.	Have you taken diuretics (water tablets) as a means of controlling your shape or weight?	YES	NO
26.	How many times have you done this over the past four weeks?	()
27.	Have you exercised <u>hard</u> as a means of controlling your shape or weight?	YES	NO
28.	How many times have you done this over the past four weeks?	()
OVER THE PAST FOUR WEEKS (28 DAYS) (PLEASE CIRCLE THE NUMBER WHICH BEST DESCRIBES YOUR BEHAVIOUR.)		NOT AT ALL	
29.	Has your weight influenced how you think about (judge) yourself as a person?	0	1 2 3 4 5 6
30.	Has your shape influenced how you think about (judge) yourself as a person?	0	1 2 3 4 5 6
31.	How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1 2 3 4 5 6
32.	How dissatisfied have you felt about your weight?	0	1 2 3 4 5 6
33.	How dissatisfied have you felt about your shape?	0	1 2 3 4 5 6
34.	How concerned have you been about other people seeing you eat?	0	1 2 3 4 5 6
35.	How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0	1 2 3 4 5 6
36.	How uncomfortable have you felt about others seeing your body: for example, in communal changing rooms, when swimming or wearing tight clothes?	0	1 2 3 4 5 6

Appendix III

Information Sheets

PATIENT INFORMATION SHEET

(7th July 2004: Version 2)

Title of Project:

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Name of Researcher: Tamara Morrison

You are invited to take part in this research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully, and discuss it with friends, family and your GP if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part when you attend for your appointment.

Consumers for Ethics in Research (CERES) publish a leaflet called *Medical Research and You*. This leaflet gives more information about medical research, and looks at some questions that you may want to ask. A copy can be obtained from CERES, PO Box 1365, London N16 0BW.

Background to the study

Research has found that the way people think has an impact on the development and maintenance of an eating disorder. It has been found that women with eating disorders pay more attention to certain types of information and are more likely to blame themselves for certain events, compared to women without an eating disorder.

The present study aims to investigate the link between paying attention to certain types of information and explanations given for different events. It is hoped that the results of this research will inform future clinical practice. The research will take approximately twelve months, although you will only need to take part for approximately 40 minutes.

Why have I been chosen?

You have recently been referred to the Outpatient Eating Disorders Service, Springfield University Hospital. All patients who are referred to this service between September 2004 and March 2005 are being asked to take part.

Do I have to take part?

You do not have to take part. If you do not take part, it will have no impact on the treatment that you will be offered.

What will happen to me if I take part?

You will be asked to complete a computer-driven Stroop task, which involves naming the colour that words are presented in. After completing this task, you will be given a short pen and paper task and three questionnaires relating to your explanations for the cause of events, your eating patterns and your mood. It is estimated that this will take approximately 40 minutes of your time.

What are the possible disadvantages and risks of taking part?

There are no known risks in taking part in this form of study. The only disadvantage is that you will be asked to give up approximately 40 minutes of your time.

What are the possible benefits of taking part?

This will not benefit you personally in any way but it may benefit future groups with similar problems to you.

What if something goes wrong?

During research trials, there can be problems due to the methods that are used or due to the way members of staff treat you. It is highly unlikely that the method being used in this study will have any harmful effects. However, if you were to be harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for legal action (but you may have to pay the costs). Regardless of this, if you wish to complain about any aspect of the way that you have been approached or treated during the course of this study, the normal NHS complaints mechanisms may be available to you.

Will my taking part in the study be kept confidential?

All information collected about you during the course of the research will be kept entirely confidential. Any information about you that leaves the hospital will have your name and address removed, so that you cannot be recognized from it. However, you will be asked if it is acceptable for the researcher to notify your GP and your subsequent therapist that you are taking part in the research.

What will happen to the results of the research study?

It is anticipated that the results will be submitted for publication in a peer-reviewed journal. You will not be identified in any report or publication. If you should wish, then you will be sent a brief summary of the findings at the end of the study (July 2005) and/or a copy of the final paper when it is published (probably in 2006).

Who is organizing and funding the research?

The research is not funded by any external source, and the researcher is not being paid for including you in the study.

Who has reviewed the study?

This study has been reviewed and approved by the Wandsworth Local Research Ethics Committee (contact number: 020 8725 3398).

Contact for further information

For further information about the study, please contact: Tamara Morrison, Sub-Dept of Clinical Health Psychology, University College London, Gower Street, London, WC1E 6BT. Tel: 020 7679 1897. If you would like to take part, please let your clinician know at your next appointment.

This copy of the Information Sheet is yours to keep. If you agree to take part, then you will be asked to sign a Consent Form, and you will be given a copy of that form.

INFORMATION SHEET - CONTROL GROUP

(7th July 2004: Version 2)

Title of Project:

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Name of Researcher: Tamara Morrison

You are invited to take part in this research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully, and discuss it with friends, family and your GP if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Consumers for Ethics in Research (CERES) publish a leaflet called *Medical Research and You*. This leaflet gives more information about medical research, and looks at some questions that you may want to ask. A copy can be obtained from CERES, PO Box 1365, London N16 0BW.

Background to the study

Research has found that the way people think has an impact on the development and maintenance of an eating disorder. It has been found that women with eating disorders pay more attention to certain types of information and are more likely to blame themselves for certain events, compared to women without an eating disorder.

The present study aims to investigate the link between paying attention to certain types of information and explanations given for different events. It is hoped that the results of this research will inform future clinical practice. The research will take approximately twelve months, although you will only need to take part for approximately 40 minutes.

Why have I been chosen?

You are being asked to take part as a non-eating disordered woman, to provide a control group for the group of eating-disordered women that is being collected elsewhere.

Do I have to take part?

You do not have to take part. If you do not take part, it will have no impact on you.

What will happen to me if I take part?

You will be asked to complete a computer-driven Stroop task, which involves naming the colour that words are presented in. After completing this task, you will be given a short pen and paper task and three questionnaires relating to your explanations for the cause of events, your eating patterns and your mood. It is estimated that this will take approximately 40 minutes of your time.

What are the possible disadvantages and risks of taking part?

There are no known risks in taking part in this form of study. The only disadvantage is that you will be asked to give up approximately 40 minutes of your time.

What are the possible benefits of taking part?

The treatment of eating disorders may be influenced by the information that you give us, since we will be more readily able to understand how women with those problems differ from women without an eating disorder.

What if something goes wrong?

During research trials, there can be problems due to the methods that are used or due to the way you are treated. It is highly unlikely that the method being used in this study will have any harmful effects. However, if you were to be harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for legal action (but you may have to pay the costs). Regardless of this, if you wish to complain about any aspect of the way that you have been approached or treated during the course of this study, the normal NHS complaints mechanisms may be available to you.

Will my taking part in the study be kept confidential?

All information collected about you during the course of the research will be kept entirely confidential. Any information about you that leaves the hospital will have your name and address removed, so that you cannot be recognized from it.

What will happen to the results of the research study?

It is anticipated that the results will be submitted for publication in a peer-reviewed journal. You will not be identified in any report or publication. If you should wish, then you will be sent a brief summary of the findings at the end of the study (July 2005) and/or a copy of the final paper when it is published (probably in 2006).

Who is organizing and funding the research?

The research is not funded by any external source, and the researcher is not being paid for including you in the study.

Who has reviewed the study?

This study has been reviewed and approved by the Wandsworth Local Research Ethics Committee (contact number: 020 8725 3398).

Contact for further information

For further information about the study, please contact: Tamara Morrison, Sub-Dept of Clinical Health Psychology, University College London, Gower Street, London, WC1E 6BT. Tel: 020 7679 1897. If you would like to take part, please let the researcher know.

This copy of the Information Sheet is yours to keep. If you agree to take part, then you will be asked to sign a Consent Form, and you will be given a copy of that form.

Appendix IV

Consent Forms

Patient Identification Number for this trial:

CONSENT FORM - PATIENT VERSION
(7th July 2004: Version 2)

Title of Project:

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Name of Researcher:

Tamara Morrison

Please initial below

1. I confirm that I have read and understand the Information Sheet dated 7th July 2004 (Version 2) for the above study, and have had the opportunity to ask questions. _____
2. I understand that my participation is voluntary, and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected. _____
3. I understand that sections of any of my medical notes may be looked at by responsible individuals from South West London and St. George's Mental Health NHS Trust or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access to my records. _____
4. I agree to take part in the above study. _____
5. I do / do not (*delete as necessary*) wish my GP to be informed that I have taken part in this study. _____

Name of patient

Date

Signature

Name of person taking consent
(if different from researcher)

Date

Signature

Name of Researcher

Date

Signature

Patient Identification Number for this trial:

CONSENT FORM - CONTROL VERSION
(7th July 2004: Version 2)

Title of Project:

Attentional Bias to Threat and Attributional Style in the Eating Disorders

Name of Researcher:

Tamara Morrison

Please initial below

1. I confirm that I have read and understand the Information Sheet dated 7th July 2004 (Version 2) for the above study, and have had the opportunity to ask questions. _____
2. I understand that my participation is voluntary, and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected. _____
3. I agree to take part in the above study. _____

Name of patient

Date

Signature

Name of person taking consent
(if different from researcher)

Date

Signature

Name of Researcher

Date

Signature

Appendix V

Standardised Instructions for the Stroop Task

Standardised Instructions for the Stroop Task

Different words are going to appear on the centre of a white screen. The words will either be in red, green, black or blue. Press the button on this pad that corresponds to the colour of the word. Try and ignore the content of the word and focus on the colour. Each word will appear for a maximum of two seconds. Try and respond as quickly as possible. Keep going even if you make a mistake. We will start with a practice of eight words, so you know what to expect.

Appendix VI

Letter to GPs

ADDRESS

DATE

Dear **NAME**

Notification to GP of patient's participation in a research project
(7th May 2004: Version 1)

Patient's name: _____

Title of Project: Attentional Bias to Threat and Attributional Style in the Eating Disorders

Name of Researcher: Tamara Morrison

As you will know, this patient has been referred to the Outpatients Eating Disorders Service at Springfield University Hospital. I am writing to let you know that we have asked the patient to take part in a research project, examining the link between attentional bias, attributional style and eating disorders. She has completed an Emotional Stroop task (naming the colour ink that a list of words is presented in on a computer), a Spot the Word test and three brief questionnaires relating to her explanations for the cause of events, her eating patterns and her mood.

It is not anticipated that there should be any side effects from this study, but please let me know if there are any unexpected changes in the patient's behaviour over the next month. If you would like more information on this research (or would like details of the outcome of the study), please contact me at the address above.

Yours sincerely

Tamara Morrison
Researcher

Appendix VII

Letter of Ethical Approval

Wandsworth Local Research Ethics Committee
St George's Hospital
Room 27
1st Floor, Grosvenor Wing
St Georges Healthcare NHS Trust
Blackshaw Road
Tooting, London
SW17 0QT

19 July 2004

Ms Tamara Morrison
Trainee Clinical Psychologist
University College London
Sub-Department of Clinical Health
Psychology
University College London, Gower Street
London
WC1E 6BT

Dear Ms Morrison,

Full title of study: Attentional Bias to Threat and Attributional Style in the Eating Disorders

REC reference number:

Protocol number: 1

Thank you for your letter of 7th July 2004, responding to the Committee's request for further information on the above research.

The further information has been considered on behalf of the Committee by the Chairman, Canon Ian Ainsworth-Smith.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation.

The favourable opinion applies to the following research site:

Site: St George's Hospital

Principal Investigator: Ms Tamara Morrison

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document Type: Application
Document Type: Investigator CV
Document Type: Protocol
Document Type: Covering Letter
Document Type: Copy of Questionnaire
Document Type: Copies of Advertisements
Document Type: Letters of Invitation to Participants
Document Type: GP/Consultant Information Sheets
Document Type: Participant Information Sheet
Document Type: Participant Consent Form
Document Type: Other

Management approval

The study may not commence until final management approval has been confirmed by the organisation hosting the research.

All researchers and research collaborators who will be participating in the research must obtain management approval from the relevant host organisation before commencing any research procedures. Where a substantive contract is not held with the host organisation, it may be necessary for an honorary contract to be issued before approval for the research can be given.

Notification of other bodies

We shall notify the research sponsor, N/A Host Organisation not specified in database. and the Medicines and Health-Care Products Regulatory Agency that the study has a favourable ethical opinion.

Statement of compliance (*from 1 May 2004*)

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

REC reference number:

Yours sincerely,

Canon Ian Ainsworth-Smith
Chairman

